

THE AMERICAN ENERGY INITIATIVE, PART 10: PIPELINE SAFETY OVERSIGHT

HEARING BEFORE THE SUBCOMMITTEE ON ENERGY AND POWER OF THE COMMITTEE ON ENERGY AND COMMERCE HOUSE OF REPRESENTATIVES ONE HUNDRED TWELFTH CONGRESS FIRST SESSION

JUNE 16, 2011

Serial No. 112-63



Printed for the use of the Committee on Energy and Commerce
energycommerce.house.gov

U.S. GOVERNMENT PRINTING OFFICE

71-668

WASHINGTON : 2013

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512-1800; DC area (202) 512-1800
Fax: (202) 512-2104 Mail: Stop IDCC, Washington, DC 20402-0001

COMMITTEE ON ENERGY AND COMMERCE

FRED UPTON, Michigan
Chairman

JOE BARTON, Texas
Chairman Emeritus
CLIFF STEARNS, Florida
ED WHITFIELD, Kentucky
JOHN SHIMKUS, Illinois
JOSEPH R. PITTS, Pennsylvania
MARY BONO MACK, California
GREG WALDEN, Oregon
LEE TERRY, Nebraska
MIKE ROGERS, Michigan
SUE WILKINS MYRICK, North Carolina
Vice Chairman
JOHN SULLIVAN, Oklahoma
TIM MURPHY, Pennsylvania
MICHAEL C. BURGESS, Texas
MARSHA BLACKBURN, Tennessee
BRIAN P. BILBRAY, California
CHARLES F. BASS, New Hampshire
PHIL GINGREY, Georgia
STEVE SCALISE, Louisiana
ROBERT E. LATTA, Ohio
CATHY McMORRIS RODGERS, Washington
GREGG HARPER, Mississippi
LEONARD LANCE, New Jersey
BILL CASSIDY, Louisiana
BRETT GUTHRIE, Kentucky
PETE OLSON, Texas
DAVID B. MCKINLEY, West Virginia
CORY GARDNER, Colorado
MIKE POMPEO, Kansas
ADAM KINZINGER, Illinois
H. MORGAN GRIFFITH, Virginia

HENRY A. WAXMAN, California
Ranking Member
JOHN D. DINGELL, Michigan
EDWARD J. MARKEY, Massachusetts
EDOLPHUS TOWNS, New York
FRANK PALLONE, Jr., New Jersey
BOBBY L. RUSH, Illinois
ANNA G. ESHOO, California
ELIOT L. ENGEL, New York
GENE GREEN, Texas
DIANA DeGETTE, Colorado
LOIS CAPPS, California
MICHAEL F. DOYLE, Pennsylvania
JANICE D. SCHAKOWSKY, Illinois
CHARLES A. GONZALEZ, Texas
JAY INSLEE, Washington
TAMMY BALDWIN, Wisconsin
MIKE ROSS, Arkansas
ANTHONY D. WEINER, New York
JIM MATHESON, Utah
G.K. BUTTERFIELD, North Carolina
JOHN BARROW, Georgia
DORIS O. MATSUI, California
DONNA M. CHRISTENSEN, Virgin Islands

SUBCOMMITTEE ON ENERGY AND POWER

ED WHITFIELD, Kentucky
Chairman

JOHN SULLIVAN, Oklahoma
Vice Chairman

BOBBY L. RUSH, Illinois
Ranking Member

JOHN SHIMKUS, Illinois

JAY INSLEE, Washington

GREG WALDEN, Oregon

JIM MATHESON, Utah

LEE TERRY, Nebraska

JOHN D. DINGELL, Michigan

MICHAEL C. BURGESS, Texas

EDWARD J. MARKEY, Massachusetts

BRIAN P. BILBRAY, California

ELIOT L. ENGEL, New York

STEVE SCALISE, Louisiana

GENE GREEN, Texas

CATHY McMORRIS RODGERS, Washington

LOIS CAPPS, California

PETE OLSON, Texas

MICHAEL F. DOYLE, Pennsylvania

DAVID B. McKINLEY, West Virginia

CHARLES A. GONZALEZ, Texas

CORY GARDNER, Colorado

HENRY A. WAXMAN, California (ex officio)

MIKE POMPEO, Kansas

H. MORGAN GRIFFITH, Virginia

JOE BARTON, Texas

FRED UPTON, Michigan (ex officio)

CONTENTS

	Page
Hon. Ed Whitfield, a Representative in Congress from the Commonwealth of Kentucky, opening statement	1
Prepared statement	2
Hon. Henry A. Waxman, a Representative in Congress from the State of California, opening statement	3
Hon. Fred Upton, a Representative in Congress from the State of Michigan, opening statement	4
Prepared statement	5
Hon. Michael C. Burgess, a Representative in Congress from the State of Texas, prepared statement	6
Hon. Bobby L. Rush, a Representative in Congress from the State of Illinois, opening statement	170
Hon. John Sullivan, a Representative in Congress from the State of Oklahoma, prepared statement	182

WITNESSES

Cynthia L. Quarterman, Administrator, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation	7
Prepared statement	9
Andrew J. Black, President, Association of Oil Pipe Lines, and on Behalf of the American Petroleum Institute	18
Prepared statement	20
Carl Weimer, Executive Director, Pipeline Safety Trust	38
Prepared statement	40
Christopher A. Helms, Executive Vice President and Group CEO, Nisource Gas Transmission and Storage, and on behalf of the Interstate Natural Gas Association of America	61
Prepared statement	63
Charles F. Dippo, Vice President, Engineering Services and System Integrity, South Jersey Gas Company, and on behalf of the American Gas Association	85
Prepared statement	87
Anthony Swift, Energy Analyst, International Program, Natural Resources Defense Council	104
Prepared statement	106

SUBMITTED MATERIAL

Texas Pipeline Best Practices Resolution, submitted by Mr. Burgess	184
--	-----

THE AMERICAN ENERGY INITIATIVE, PART 10: PIPELINE SAFETY OVERSIGHT

THURSDAY, JUNE 16, 2011

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:33 a.m., in room 2322 of the Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Members present: Representatives Whitfield, Shimkus, Terry, Burgess, Bilbray, Olson, Pompeo, Griffith, Barton, Upton (ex officio), Rush, Inslee, Green, and Waxman (ex officio).

Staff present: Carl Anderson, Counsel, Oversight; Gary Andres, Staff Director; Charlotte Baker, Press Secretary; Anita Bradley, Senior Policy Advisor to Chairman Emeritus; Maryam Brown, Chief Counsel, Energy and Power; Aaron Cutler, Deputy Policy Director; Andy Duberstein, Special Assistant to Chairman Upton; Garrett Golding, Legal Analyst, Energy; Cory Hicks, Policy Coordinator, Energy and Power; Katie Novaria, Legislative Clerk; Caitlin Haberman, Democratic Policy Analyst; and Alexandra Teitz, Democratic Senior Counsel, Environment and Energy.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. I would like to call this hearing to order. This is our 10th day of the American Energy Initiative. We have had a serious of hearings on the energy needs of the American people, and today we are going to turn our focus to a particularly important issue, and that is pipeline safety.

Recent major pipeline accidents in San Bruno, California; Marshall, Michigan; and Allentown, Pennsylvania have thrust our attention on the Nation's pipeline system and the regulations that ensure their safety. Today we hope to reconvene the dialogue that began last year with a similar hearing called in response to those accidents. And, of course, the last time that pipeline safety was reauthorized was back in 2006, and it is time for us to revisit that as well.

As some in this room might remember, our last pipeline safety reauthorization bill, as I said, was in 2006. We worked together in a lengthy bipartisan process that allowed us to pass the bill under suspension on the House floor. The PIPES Act expired in December

of last year, but funding levels remain in place under the present Continuing Resolution.

It is our intention to craft a pipeline safety bill that enhances current authorities and can provide greater protection for our infrastructure, communities, and the environment. This process begins today with this hearing. We have wide and varying interests represented on the witness panel and I look forward to hearing their perspective on all of these issues. With the information and discussion provided today, committee members can get the proper context for the issues we will work together on later this summer.

Although the major accidents mentioned earlier should be a part of today's dialogue, I am sure we will not rush to any conclusion before the National Transportation Safety Board completes its investigations. We have been told this will not happen for several months or possibly even next year. Before we write laws or push for regulations that explicitly address those accidents, we should wait until all the facts are in. Until that time, there are several areas where pipeline safety can and should be improved which we can get moving in the very near future.

It is my belief that Members from both sides of the aisle can find a common purpose on these issues and work together to produce effective and meaningful legislation that protects the public and environment.

And at this point I would like to recognize Mr. Waxman for the purpose of making an opening statement.

[The prepared statement of Mr. Whitfield follows:]

PREPARED STATEMENT OF HON. ED WHITFIELD

In our ninth day of the American Energy Initiative hearing, we will turn our attention to a very important and bipartisan issue confronting all of our constituents—pipeline safety. Recent major pipeline accidents in San Bruno, California, Marshall, Michigan, and Allentown, Pennsylvania have thrust our attention on the nation's pipeline system and the regulations that ensure their safety. Today we hope to reconvene the dialogue that began last year with a similar hearing called in response to these accidents.

In Kentucky, we have a major artery that serves 140,000 customers and 31 counties, many of which are in my District. I am sure other Members of this committee can talk about the impact that pipelines have on their District. We must make sure these pipelines are safe.

As some in this room might remember, our last pipeline safety reauthorization bill made its way through committee in late 2006. We worked together in a lengthy bipartisan process that allowed us to pass the bill under suspension on the House floor. The PIPES Act expired in December of last year, but funding levels remain in place under the present Continuing Resolution.

Rather than simply pushing this issue further down the road, it is our intention to craft a pipeline safety bill that enhances current authorities and can provide greater protection for our infrastructure, communities, and the environment.

This process begins today with this hearing. We have wide and varying interests represented on the witness panel and I look forward to hearing their perspective. With the information and discussion provided today, committee members can get the proper context for the issues we will work together on later this summer.

Although the major accidents mentioned earlier should be a part of today's dialogue, we should restrain ourselves from rushing to conclusions before the National Transportation Safety Board completes its investigations. We have been told this will not happen for several months or possibly next year. Before we write laws or push for regulations that explicitly address those accidents, we should wait until all the facts are in. Until that time, there are several areas where pipeline safety can and should be improved which we can get moving in the near future.

It is my belief that members from both sides of the aisle can find a common purpose on these issues and work together to produce effective and meaningful legislation that protects the public and environment.

I thank the witnesses for being here And I now yield to the Ranking Member, Mr. Rush for his opening statement.

OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. WAXMAN. Thank you very much, Mr. Chairman.

The ranking member of the subcommittee, Congressman Rush, was unable to be here at the beginning of this hearing because the time had been changed and he had already made a previous engagement. But I understand he will be given a chance to make an opening statement when he arrives.

It is clear we need to pay serious attention to pipeline safety. Experts have been warning of the hazards of deteriorating infrastructure in this country, and natural gas and hazardous material pipelines are a prime example. There has been a burst of new construction in the last few years which puts further stress on pipeline safety oversight resources. The system is showing clear signs of strain and people and the environment are paying the price.

Here is what we have seen over the past year and a half: two natural gas pipeline explosions that killed 13 people and damaged over 150 homes and businesses; a spill of over 800,000 gallons of diluted bitumen, a heavy tar-like substance from the Canadian tar sands into the Kalamazoo River, 30 miles of the river expected to remain closed over a year after the spill, and cleanup costs are estimated at over \$500,000 million; a second spill of over 250,000 gallons from the same pipeline 6 weeks later; 12 spills on the new Keystone pipeline in its first year of operation. This pipeline also carries diluted bitumen. Most of these spills were small, but after two larger ones, PHMSA shut down the pipeline finding that continued operation without corrective action would be hazardous to life, property, and the environment; a trench collapse for the new Bison natural gas pipeline in Montana, moving fishers 3 to 4 feet deep and hundreds of feet long.

In addition, PHMSA recently found that some steel pipe produced between 2007 and 2009 was defective. Five of the seven pipelines PHMSA investigated contained the defective pipe, which had to be replaced, but other pipelines may also have used it. There is no current requirement for them to test for defective steel pipe.

These pipeline incidents are tragic and we must act to prevent more loss of life and property in the future. These incidents are the canary in the coalmine, warning about the state of our pipeline safety. We may pay a very high price for ignoring these warnings. We need to make sure that we are anticipating and preventing these pipeline safety disasters before they occur. In particular, oil companies are rapidly and dramatically expanding the quantity of tar sands crude in the form of diluted bitumen. That they are moving through pipelines in this country, concerns have been raised that diluted bitumen poses a greater risk both in terms of the likelihood of spills and the challenges of cleanup.

We need to understand these risks and address them and we need to do that before approving another tar sands pipeline, not after a pipeline is built with inadequate protections. Yet just yesterday this subcommittee moved legislation to short-circuit the approval process for the newest tar sands pipeline before holding this hearing. That legislation is a mistake. We should understand the unique safety concerns for tar sands pipelines, not accelerate pipeline approval.

We have had a history of bipartisan action on pipeline safety, and there is a lot of room for agreement in this area. I look forward to working with the Republican majority on this issue.

Mr. WHITFIELD. Thank you, Mr. Waxman. And when Mr. Rush does arrive, we will give him an opportunity to make his opening statement.

At this time I would like to recognize the chairman of the full committee, Mr. Upton, for opening statement.

OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. UPTON. Well, thank you, Mr. Chairman.

For years, pipeline safety has been a topic that enjoys bipartisan cooperation and produces very effective legislation. The last time this committee took up legislation on the subject, we were able to pass the bill under suspension on the House floor. And as the 2006 law expires, it is our responsibility to put forward meaningful legislation this summer that will improve pipeline safety and allow our pipeline infrastructure to remain a dynamic and efficient method for transporting vital energy supplies.

The first step in the process is certainly today's broad survey of the world of pipeline safety. We have with us all the major stakeholders and experts, as well as the lead regulator on pipeline safety. The Pipeline and Hazardous Material Safety Administration is an effective enforcer of this Nation's pipeline regulations and laws, and I look forward to hearing how their processes, authorities, and resources could be enhanced with legislation in the future, as well as how the companies and interests represented at the witness table today believe that their industry could be rendered even safer.

Pipelines are the safest method of transporting hazardous liquids and natural gas. The incident rate is extraordinarily small, but when things do go wrong, they can go wrong in a big way. That is for sure. And I do not have to look too far for an example of this, as 20,000 barrels of oil spilled out of a ruptured line into a tributary of the Kalamazoo River just one county outside of my district last year. I was aggressive in my efforts to get the spill cleaned up and the environment restored, but when it comes to policy changes, we cannot focus only on the response to a spill. We also have to focus on preventing pipeline safety failures before they happen.

The overall strong safety record of hazardous liquid and natural gas pipelines can be marred by isolated failures that put human life, property, and the environment at risk. Pipeline safety is an issue that we all take very seriously. And I have let it be known that this committee is certain to move on a bipartisan reauthorization bill later this summer. Our goal should be to craft an effective

bill that ensures another community doesn't experience a spill that affects their waterways or a massive explosion that levels a neighborhood.

This hearing will give members a broad view of the status of the pipeline safety laws and regulations and will inform us of what might be the best path forward as we craft legislation. I look very forward to the discussion that we are going to host today and the ideas that will be proposed. I want to particularly thank the administrator for pipeline safety, Ms. Quarterman, for her graciousness for allowing us to have one panel instead of two as we are expecting about 3 hours of votes in about an hour. So we are able to hopefully get this adjourned before that starts because I am not sure how many people are going to have to come back after 3 o'clock.

And I yield the balance of my time to Mr. Terry.

[The prepared statement of Mr. Upton follows:]

PREPARED STATEMENT OF HON. FRED UPTON

For years, pipeline safety has been a topic that enjoys bipartisan cooperation and produces effective legislation. The last time this committee took up legislation on the subject, we were able to pass the bill under suspension on the House floor. As the 2006 law expires, it is our responsibility to put forward meaningful legislation this summer that will improve pipeline safety and allow our pipeline infrastructure to remain a dynamic and efficient method for transporting vital energy supplies.

The first step in this process is today's broad survey of the world of pipeline safety. We have with us all the major stakeholders and experts as well as the lead regulator on pipeline safety. The Pipeline and Hazardous Material Safety Administration is an effective enforcer of this nation's pipeline regulations and laws. I look forward to hearing how their processes, authorities, and resources could be enhanced with legislation in the future as well as how the companies and interests represented at the witness table today believe their industry could be rendered safer.

Pipelines are the safest method of transporting hazardous liquids and natural gas. The incidence rate is extraordinarily small, but when things do go wrong, they can go wrong in a very big way. I do not have to look too far for an example of this, as 20,000 barrels of oil spilled out of a ruptured line into a tributary of the Kalamazoo River just one county outside of my district. I was aggressive in my efforts to get the spill cleaned up and the environment restored. But when it comes to policy changes, we cannot focus only on the response to a spill—we must focus on preventing pipeline safety failures before they happen.

The overall strong safety record of hazardous liquid and natural gas pipelines can be marred by isolated failures that put human life, property, and the environment at risk. Pipeline safety is an issue I take very seriously. I have let it be known this committee is certain to move on a bipartisan reauthorization bill this summer. Our goal should be to craft an effective bill that ensures another community doesn't experience a spill that affects their waterways or a massive explosion that levels a neighborhood.

This hearing will give members a broad view on the status of pipeline safety laws and regulations and will inform us of what might be the best path forward as we craft legislation. I very much look forward to the discussion we will host today and the ideas that will be proposed and debated.

Mr. TERRY. Thank you, Mr. Chairman. I appreciate that opportunity to thank all of our witnesses for being here.

And certainly just like our national interstate system, we want to design it so it is as safe as possible to travel on. Our pipeline system is critical to our energy infrastructure. And, as we know, as Mr. Upton said and Ranking Member Waxman mentioned is that sometimes there are problems. The explosion in San Bruno, California that killed, I think, eight people; incident in Arizona a couple of years ago. So as Fred said, when something goes bad, it

can really have devastating effects on loss of life. So we need to get it as close to perfect as we can. So your testimony here will help do that.

I do want to add to Mr. Waxman's comments about the TransCanadian pipeline. I think after 3 years of reviewing it and sitting on a foot-and-a-half environmental impact studies and supplementals that it is time for them to start action in the State Department and make a decision. So I don't think it was hasty or irresponsible at all. In fact, I think the irresponsible is the foot-dragging by our Agencies on several energy projects.

With that I will yield back.

Mr. BURGESS. Would you yield to me?

Mr. TERRY. I will not yield back. I am going to yield to Mr. Burgess.

Mr. BURGESS. I appreciate you yielding me a generous amount of time.

Mr. Chairman, I am going to ask unanimous consent to insert my entire statement into the record.

But I live in an area of Texas where there is a complex and complicated network of natural gas pipelines above the Barnett Shale. I just want to point out that not all regulations need to be at the federal level. The consortium of mayors got together in my area and collaborated on a Pipeline Best Practices Guideline, and Mr. Chairman, I would like to ask unanimous consent to submit that for the record.

Mr. WHITFIELD. Without objection.

[The information appears at the conclusion of the hearing.]

Mr. BURGESS. And I will yield back Mr. Terry's time.

[The prepared statement of Mr. Burgess follows:]

PREPARED STATEMENT OF HON. MICHAEL C. BURGESS

Thank you, Mr. Chairman.

This hearing is an important one for this committee to be having. Last year, we watched as other committees held hearing after hearing on pipeline safety, chipping away at the jurisdiction this committee should have been exerting from the start. Pipeline safety as a matter of energy policy is crucial to what we do here.

Last year's events in Michigan and California were tragic reminders that safely upkeeping our nation's energy infrastructure is an ongoing process, and we must be diligent in protecting the lives of those around pipelines. It is true, in many areas of the country, including my backyard in north Texas, civilization is encroaching on pipelines just as pipelines are encroaching on civilization. Homes are being built closer and closer to infrastructure that was laid decades ago, in what used to be rural lands. Now, as the population has increased and urban density is forcing people to move further and further into the country, pipelines that were once miles from anywhere are suddenly right underneath residents' backyards.

As people require more and more natural gas—one of the cleaner fuels on the market—more pipelines and infrastructure will be needed to meet the demand. What is not clear is how best to move forward with regulating this increased infrastructure. Some on this committee have called for new federal regulations. And that might be required, but we must fully review the conclusions from the investigations of past pipeline explosions and incidents to learn from them. Not all regulations must be at the federal level—a consortium of mayors in my district collaborated on a 'Pipeline Best Practices' guideline.

I am glad we are here today. We need to be looking into what is happening that has caused the isolated incidents over the past few years—is it a wild coincidence that these incidents have occurred within such a short span of each other, or is there a fundamental flaw in how we monitor and design our pipelines? We need firm answers to questions like these in order to best know how to move forward,

balancing our need for increased, clean energy with the health and lives of those who live so close to energy infrastructure.

With that, I yield back.

Mr. WHITFIELD. You went over 16 seconds.

Well, that concludes the opening statements except for Mr. Rush's. And I want to thank all the witnesses for being with us today and also we appreciate your flexibility in allowing us to change the time of the starting of the hearing.

And with us today we have Ms. Cynthia Quarterman, who is the administrator of the Pipeline and Hazardous Materials Safety Administration at the Department of Transportation. We have Mr. Andy Black, who is president of the Association of Oil Pipe Lines and on Behalf of the American Petroleum Institute as well. We have Mr. Carl Weimer, who is the executive director of the Pipeline Safety Trust. We have Mr. Christopher Helms, who is executive vice president and group CEO of NiSource Gas Transmission and Storage, and also on behalf of the Interstate Natural Gas Association of America. We have Mr. Charles Dipppo, who is vice president, Engineering Services and System Integrity for South Jersey Gas Company, and also on behalf of the American Gas Association. And we have Mr. Anthony Swift, who is the energy analyst for International Programs at the Natural Resources Defense Council.

So thank you for being with us. All of you have a great deal of expertise in this area, which we know will be beneficial for us. And each one of you will be given 5 minutes for the purpose of an opening statement. And there is a little device there that will say green when it is time to go, yellow when you think about stopping, and red, I hope you might stop at that point. But we do look forward to your testimony. And at this time, Ms. Quarterman, I will recognize you for 5 minutes for your opening statement.

STATEMENTS OF CYNTHIA L. QUARTERMAN, ADMINISTRATOR, PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION; ANDREW J. BLACK, PRESIDENT, ASSOCIATION OF OIL PIPE LINES, AND ON BEHALF OF THE AMERICAN PETROLEUM INSTITUTE; CARL WEIMER, EXECUTIVE DIRECTOR, PIPELINE SAFETY TRUST; CHRISTOPHER A. HELMS, EXECUTIVE VICE PRESIDENT AND GROUP CEO, NISOURCE GAS TRANSMISSION AND STORAGE, AND ON BEHALF OF THE INTERSTATE NATURAL GAS ASSOCIATION OF AMERICA; CHARLES F. DIPPO, VICE PRESIDENT, ENGINEERING SERVICES AND SYSTEM INTEGRITY, SOUTH JERSEY GAS COMPANY, AND ON BEHALF OF THE AMERICAN GAS ASSOCIATION; AND ANTHONY SWIFT, ENERGY ANALYST, INTERNATIONAL PROGRAM, NATURAL RESOURCES DEFENSE COUNCIL

STATEMENT OF CYNTHIA L. QUARTERMAN

Ms. QUARTERMAN. Thank you. Chairman Whitfield, Ranking Member Rush, members of the subcommittee, thank you for the opportunity to speak today to discuss the Pipeline and Hazardous Materials Safety Administration's oversight of America's vast network of energy pipelines.

Safety is the number one priority of Secretary LaHood, myself, and the employees of PHMSA and we are strongly committed to reducing transportation risks to the public and environment. More than 2.5 million miles of pipelines across the Nation deliver energy to homes and businesses, connect communities, and support our way of life. PHMSA's role in ensuring the safety of each and every mile is vital. To get the job done, we develop and enforce regulations and maintain strong partnerships with States, who oversee most of the intrastate pipelines. Through strong regulations and integrity management programs, PHMSA has significantly reduced accidents and increased accountability for managing the risks of pipeline operations. Serious pipeline incidents have dropped by more than half over the past 20 years. However, we still have much work to do.

In the wake of several recent serious pipeline incidents, PHMSA is taking a hard look at the Nation's pipelines. The pipeline infrastructure needs more attention to help ensure it will continue to meet the huge demand later generations will place on it to meet America's energy delivery needs.

In April, Secretary LaHood and I developed an action plan requiring pipeline stakeholders to act, to be aggressive, and be transparent in charting a course to accelerate the identification, repair, rehabilitation, and replacement of high-risk pipeline infrastructure. As part of our action plan, we brought together everyone with a role in pipeline safety to engage in discussions. We have also met with government, industry executives, pipeline employees' representatives, States, and the public interest community to discuss the actions all pipelines can take to raise the safety bar.

While we continue think about next steps, PHMSA looks forward to working with Congress on the reauthorization of its Pipeline Safety program. While previous reauthorizations have helped to advance pipeline safety by providing additional resources to better exercise the Department's enforcement authority, enhanced protection through integrity management requirements for distribution pipelines, and increased support for state pipeline safety agencies, we still need to do more. Pipeline safety could be greatly improved with the passage of reforms pushing stronger enforcement authority, expanded integrity management requirements beyond those areas where there are existing high-consequence areas, improved pipeline data collection, and by advancing safety in many other ways.

Mr. Chairman, thank you for the opportunity to testify before this subcommittee and report on PHMSA's oversight role of pipelines and the opportunities that exist to strengthen oversight. I look forward to answering any questions you may have.

[The prepared statement of Ms. Quarterman follows:]



**UNITED STATES DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION**

**Hearing on
The American Energy Initiative**

**Before the Subcommittee on Energy and Power
Committee on Energy and Commerce
United States House of Representatives**

**Written Statement of Cynthia L. Quarterman
Administrator
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation**

**Expected Delivery 10:00 a.m.
June 16, 2011**

Quarterman Written Statement: House Hearing on The American Energy Initiative

CYNTHIA L. QUARTERMAN, PHMSA ADMINISTRATOR
SUMMARY OF TESTIMONY

Safety is the number one priority of the U.S. Department of Transportation (DOT). The Department and all of its employees are strongly committed to reducing transportation risks to the public and environment.

More than 2.5 million miles of pipelines deliver energy to homes and businesses across America. It is DOT's job to ensure that every mile is safe to protect this infrastructure that is critical to the U.S. economy and our everyday lives. Through its Pipeline and Hazardous Materials Safety Administration (PHMSA) DOT develops and enforces regulations, and partners with States who oversee most of the intrastate pipelines. Over the years, PHMSA has significantly reduced accidents and increased accountability for managing the risks of pipeline operations through strong regulations and integrity management programs. The nation has seen serious pipeline incidents drop by more than half over the past 20 years, in addition, the number of liquid pipeline spills with environmental consequences has significantly decreased over the last decade.

In the wake of several recent serious pipeline incidents, PHMSA is taking a hard look at the nation's pipelines. The pipeline infrastructure needs more attention and investments now will help ensure it can continue to meet America's energy delivery needs for future generations. The Department's call to action for all pipeline stakeholders is helping to chart a course to accelerate the identification, repair, rehabilitation and replacement of high risk pipeline infrastructure before it becomes a risk to people or the environment.

PHMSA looks forward to working with Congress on the reauthorization of its pipeline safety program. While previous reauthorization attempts have helped to advance pipeline safety by providing additional resources to better exercise the Department's enforcement authority, enhance protections through integrity management requirements for distribution pipelines, and increase support for State pipeline safety agencies, we need to do more. Pipeline safety could be greatly improved with the passage of reforms pushing stronger enforcement authority, expanded integrity management requirements for areas beyond existing high consequence areas, improving pipeline infrastructure data collection, and advancing safety in other important ways.

Quarterman Written Statement: House Hearing on The American Energy Initiative

WRITTEN STATEMENT
OF
CYNTHIA L. QUARTERMAN
BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY AND POWER
UNITED STATES HOUSE OF REPRESENTATIVES

June 16, 2011

I. INTRODUCTION

Chairman Whitfield, Ranking Member Rush, members of the Subcommittee, thank you for the opportunity to appear today to discuss the Pipeline and Hazardous Materials Safety Administration's (PHMSA) oversight of America's vast network of energy pipelines. Safety is the number one priority of Secretary Ray LaHood, myself, and the employees of PHMSA and we are all strongly committed to reducing transportation risks to the public and environment. Our Nation's reliance on the safe and environmentally sound transportation of energy fuels and hazardous materials is increasing. PHMSA's safety oversight of the pipeline network that delivers these products is providing critical protections for the American people.

More than 2.5 million miles of pipelines deliver energy to homes and businesses across America, and our job at the U.S. Department of Transportation is to ensure that every mile is safe. Doing this job right is important because protecting the infrastructure is critical to the U.S. economy and our everyday lives. To get the job done, PHMSA develops and enforces regulations, and partners with States who oversee most of the intrastate pipelines. Through strong regulations and integrity management programs, PHMSA has significantly reduced accidents and increased accountability for managing the risks of pipeline operations. Serious pipeline incidents have dropped by more than half over the past 20 years, and we want that trend to continue. Likewise, the number of liquid pipeline spills with environmental consequences has significantly decreased over the last decade. However, we still have much work to do.

In the wake of several recent serious pipeline incidents, PHMSA is taking a hard look at the nation's pipelines. The pipeline infrastructure—like our roads, bridges, ports, and rail

Quarterman Written Statement: House Hearing on The American Energy Initiative

infrastructure—needs more attention. Investments now will ensure the safety of the American people and the integrity of the pipeline infrastructure to deliver energy for future generations. We are issuing a call to action for all pipeline stakeholders, including the public, the pipeline industry and our State partners. Together, we need to chart a course to accelerate the identification, repair, rehabilitation and replacement of high risk pipeline infrastructure before it becomes a risk to people or the environment. PHMSA is specifically calling on State Public Utility Commissions to establish cost recovery mechanisms that effectively address infrastructure replacement costs.

Through rulemaking and pipeline safety advisories since 2009, PHMSA has closed a record 12 National Transportation Safety Board safety recommendations, addressing leak detection systems, excess flow valves, human fatigue, and operations of pipeline companies' control rooms, as well as integrity management for distribution pipelines in high consequence areas. During that same period, PHMSA also closed its final Office of Inspector General and Government Accountability Office recommendations.

PHMSA looks forward to working with Congress on the reauthorization of its pipeline safety program. DOT supports reforms to increase pipeline companies' accountability for operating their pipelines in a safe and environmentally sound manner.

II. PIPELINE SAFETY ACTION PLAN

Much of the nation's pipeline infrastructure was installed many decades ago, and some century-old infrastructure continues to transport energy supplies to residential and commercial customers, particularly in the urban areas across our nation. While age alone does not determine the integrity of a pipeline system, some older pipeline facilities that are constructed of certain materials (e.g., cast iron, copper, bare steel, and certain kinds of welded pipe) may have degraded over time, others do not meet today's pipeline construction standards, and some have been exposed to additional threats, such as excavation damage. In addition, there are some early vintage steel pipelines in high consequence areas that may pose risks because of incomplete records, poor construction practices, or inadequate risk assessments. We need to make sure these risks are identified, the pipelines are assessed accurately, and preventative and mitigative steps are taken where they are needed. We need to substantially reduce the risk of pipeline failures that can have catastrophic consequences.

Quarterman Written Statement: House Hearing on The American Energy Initiative

In April, Secretary LaHood and I developed an action plan to accelerate rehabilitation, repair, and replacement programs for high-risk pipeline infrastructure. We are engaging pipeline safety stakeholders in the process to systematically address parts of the pipeline infrastructure that need attention, and ensure that Americans remain confident in the safety of their families, their homes, and their communities. The strategy includes the three components below.

Call to Action - Secretary LaHood and I issued a “Call to Action,” actively engaging our State partners, technical experts, and pipeline companies to focus on identifying pipeline risks and repairing, rehabilitating, and replacing the highest risk infrastructure.

Aggressive Efforts - Secretary LaHood and I met with pipeline executives as well as the FERC Chairman, the National Association of Regulatory and Utility Commissioners (NARUC) to discuss actions that PHMSA, States, industry and the public can take to drive more aggressive actions to raise the bar on pipeline safety; and the challenges to implementing these actions. PHMSA hosted a public meeting to gather input and PHMSA is now working on a Report to America on the Pipeline Infrastructure drawn from the ideas presented in the Forum.

Transparency - PHMSA is actively seeking input from all stakeholders and is executing this plan in a transparent manner with an opportunity for public engagement, including a dedicated website for this initiative, and regular updates to the public.

III. ACCOMPLISHMENTS

Regulatory Initiatives - PHMSA has conducted a thorough review of its inspection and enforcement related regulations, procedures, and guidance, as well as its data collection and transparency efforts. PHMSA has issued six final rules: 1) to require operators of gas distribution pipelines to develop and implement integrity management programs similar to those required for gas transmission and hazardous liquid pipelines; 2) to address human factors and other aspects of control room management for pipelines where controllers use supervisory control and data acquisition systems; 3) to regulate the remaining population of unregulated rural hazardous liquid low stress pipelines, which was required by the Pipeline Inspection, Protection, Enforcement, and Safety (PIPES) Act of 2006; 4) to improve data collection from operators of pipelines and liquefied natural gas facilities; 5) to clarify data and annual reporting requirements; and 6) to expedite the deadlines in the control room management rule for pipelines. In addition, PHMSA has proposed new rulemakings that relate to damage prevention and integrity management for hazardous liquid

Quarterman Written Statement: House Hearing on The American Energy Initiative

pipelines. Finally, PHMSA has issued several advisory bulletins to the industry, including bulletins related to leak detection, welding quality, oil spill and emergency response plans, and Maximum Allowable Operating Pressure.

Enforcement - PHMSA has significantly increased its inspection and enforcement personnel by 29 percent since 2008. As a result, PHMSA has been able to reduce its enforcement case backlog; during this period PHMSA initiated 666 enforcement cases, closed 784 cases, and issued 264 Final Orders. Since 2008, PHMSA has proposed \$21,635,300 in civil penalties. PHMSA takes enforcement actions to ensure that operators are held accountable for compliance with safety laws. In the past year, PHMSA issued numerous safety orders to pipeline operators requiring them to perform testing, repairs, and rehabilitation efforts along their systems following the discovery of safety concerns. Safety orders include Corrective Action Orders, which are issued often to assure companies perform appropriate corrective and remedial actions in a timely manner. Examples of corrective action include requiring operators to replace complete pipeline sections, implement corrosion control and remediation strategies, and implement whole health studies to address possible systematic safety issues. In addition, we are currently in the process of inspecting operators' public awareness programs and preparing States for gas distribution integrity management program (DIMP) inspections.

State Partnership - PHMSA increased funding to its State pipeline safety partners, and is covering about 66% percent of State pipeline safety program costs, totaling \$66.5 million for 2009 and 2010. PHMSA also provides comprehensive training for all State and Federal pipeline safety inspectors on both compliance oversight and safety investigation functions. With respect to DIMP, PHMSA trained State inspectors, helped develop State inspection forms, FAQs, and inspection guidance for implementing DIMP, and performed joint Federal-State pilot inspections to validate and enhance inspection forms and guidance. PHMSA also helps local, State and Federal officials determine the public impact and provides as much investigative, legal, and technical assistance, as necessary.

Damage Prevention - The vast majority of America's pipeline network is underground making pipelines vulnerable to "dig-ins" by third-party excavators. While excavation damage is 100% preventable, it remains a leading cause of pipeline incidents involving fatalities and injuries. Since 2008, PHMSA provided over \$6 million dollars in State Damage Prevention grants. Eligible grantees include State one call centers, State pipeline safety agencies, or any organization created

Quarterman Written Statement: House Hearing on The American Energy Initiative

by State law and designated by the Governor as the authorized recipient of the funding. PHMSA also uses the authority in the PIPES Act to promote public education awareness with national programs such as the “811- Call Before You Dig” initiative through the Common Ground Alliance (CGA). PHMSA has provided over \$2.3 million in funding assistance for CGA’s 811 advertising campaign since 2002.

Emergency Response - Since 2002, PHMSA has spent over \$8 million in support of training for firefighters and others to safely respond to pipeline emergencies, including the development of a new internet based training program through a cooperative agreement with the National Association of State Fire Marshals. The training curriculum, “Pipeline Emergencies – 2nd Edition,” builds off of the positive results of the previous edition, which helped train over 45,000 first responders in the U.S. on how to safely respond to natural gas and hazardous liquid pipeline leaks, spills and fires. When incidents occur, PHMSA works closely with responding local, State, and Federal officials to assure the impact to the public and environment is minimized and that the pipeline company is fully cooperating on safety issues.

Public Awareness - PHMSA has conducted numerous activities to inform the public and engage public interest and participation in all of its initiatives. PHMSA supported the organization of the Pipelines and Informed Planning Alliance (PIPA). PIPA advances the development and use of risk-informed land use guidelines to protect pipelines and communities. PIPA released fifty recommendations to help local governments, real estate developers, and community planners better plan projects in areas near transmission pipelines in the report titled *Partnering to Further Enhance Pipeline Safety in Communities through Risk-Informed Land Use Planning*. A companion effort is helping communities understand where pipelines are located, who owns and operates them, and what other information is available for community planning. Vital information that communities need for land use, environmental, and emergency planning around pipelines remains publicly available through PHMSA’s National Pipeline Mapping System (NPMS). We continue to work with States, industry, and other stakeholders to make the NPMS information more accurate and useful.

IV. REAUTHORIZATION

As I mentioned, PHMSA looks forward to working with the Congress on the reauthorization of its pipeline safety program. While previous reauthorization attempts have helped to advance

pipeline safety by providing additional resources to better exercise the Department's enforcement authority, enhance protections through integrity management requirements for distribution pipelines, and increase support for State pipeline safety agencies, we need to do more. PHMSA supports reforms for even stronger enforcement authority, expanding integrity management requirements beyond existing high consequence areas, improving pipeline infrastructure data collection, and advancing safety in other important ways.

Increase Civil Penalties – PHMSA supports increasing administrative civil penalties for serious violations leading to deaths, injuries, or significant environmental damage. For these types of violations, PHMSA supports increasing the caps from \$100,000 per violation per day/\$1,000,000 per series of related violations, to \$250,000 per violation per day/\$2,500,000 per series of related violations. The maximum penalties for violations of the pipeline safety requirements have not been increased in almost 10 years. Adequate levels of penalties are necessary to achieve deterrence goals, particularly in serious cases in which violations led to injuries, fatalities, or significant environmental damage.

Expanding Integrity Management Protection – PHMSA supports reforms to review whether pipeline safety would be improved by expanding and revising the integrity management program requirements beyond existing high consequence areas to additional areas.

Pipeline Infrastructure Data Collection Authority – PHMSA supports reforms to allow the collection of additional data on physical attributes of most jurisdictional pipelines and geospatial location pipeline data on larger jurisdictional pipelines. Geospatially accurate pipeline infrastructure data is critical to PHMSA's and its State pipeline safety partner's ability to perform regulatory and oversight functions.

Remove Statutory Exemptions – PHMSA supports reforms to eliminate all remaining statutory exemptions for both gas and hazardous liquid gathering lines. Significant spills and incidents have occurred on gathering lines and removal of these exemptions would be consistent with PHMSA's longstanding effort to capture the remaining pipeline mileage that is currently unregulated, but may warrant regulation. Production facilities and flow lines would remain non-jurisdictional.

Reimbursement For Design Reviews/Construction Oversight – PHMSA supports reforms to seek reimbursement from project applicants for design review, consulting, and field oversight that the agency performs for new pipeline construction projects over 100 miles in length.

Quarterman Written Statement: House Hearing on The American Energy Initiative

Currently only fully operational pipelines support the costs of PHMSA oversight through user fees; those in the planning or construction phases pay no fees to support the significant efforts expended on ensuring the technical adequacy of novel or non-conforming design, or in conducting oversight of construction to ensure compliance with the pipeline safety codes before the pipeline is covered and put into service. These reforms would place the associated financial burden on the applicant who stands to realize the benefits from the proposed project - without warping PHMSA's allocation of effort and expenses to pipelines already in operation.

Special Permit Fees – PHMSA supports reforms such as a filing fee for special permit applications to reimburse the agency for costs incurred to review those applications - whether for conducting technical studies or environmental analyses. The applicant who stands to benefit from the special permit project should pay for this service.

V. CONCLUSION

In closing, we look forward to working with Congress to address any issues you may have concerning PHMSA's pipeline safety program and the regulation of gas and hazardous liquid pipelines. PHMSA very much appreciates the opportunity to report on our oversight role of these pipelines and the opportunities that exist to strengthen oversight.

###

Mr. WHITFIELD. Thank you, Ms. Quarterman. And at this time, Mr. Black, you are recognized for 5 minutes for your opening statement.

STATEMENT OF ANDREW J. BLACK

Mr. BLACK. Thank you, Chairman Whitfield. I appreciate the opportunity to appear on behalf of AOPL and API.

Pipelines have long been the safest way to move crude oil and refined petroleum products such as gasoline, diesel fuel, jet fuel, home heating oil, and propane. Pipelines are also the most reliable and efficient way to move these fuels, which American consumers and workers depend upon in our economy and our quality of life.

The safety record of the liquid pipeline industry shows strong improvement over the past decade. There are significantly fewer pipeline accidents and less volume released of product than 10 years ago because of new laws and regulations, vigorous company actions, and improving technologies. Each of the major causes of pipeline accidents also showed marked decreases during this time period reflecting the successive strategies to manage risks better.

Pipeline operators have every incentive to invest in safety. Most important is the potential for injury to members of the public, on employees, our contractors, and effects upon the environment. Operators can incur costly cleanups, repairs, litigations, and fines, and a pipeline may not be able to provide service to its customers if a facility needs to be shut down. Operators of liquid pipelines invest millions of dollars annually to maintain their pipelines to comply with safety laws and regulations. One survey of a group of members showed that \$3.3 billion was spent on integrity management activities in just the past 6 years.

These costs will only increase as integrity management tools become more expensive, more differentiated, and more effective at identifying issues for operators to address. These costs are ultimately borne by the shippers who pay for transportation services and the consumers of products that are shipped through the pipeline. Operators work hard to learn from pipeline incidents and share ideas and improvements for best practices. The industry has standing teams and workshops to assess integrity management issues, review incidents and near-misses, analyze data, and make technically-based recommendations to industry leaders. Industry invests in R&D to develop new technologies and practices to confront pipeline challenges and pushes technology vendors to do the same.

We continue to work very hard at the company and association level to achieve the goal of zero releases. Congress has provided PHMSA with broad authority to regulate pipeline safety. PHMSA is an aggressive regulator, conducting rigorous inspections and vigorously enforcing compliance with pipeline safety laws. PHMSA has the tools and uses them when necessary. Operators face a comprehensive set of requirements for construction, operation, and maintenance of a pipeline. Regulations cover everything from design standards to operational controls, qualification of personnel, public awareness, infrastructure and incident reporting, emergency response, and much more.

While we do not yet have the final results in investigations in a recent high-profile pipeline accidents, it is important to note that existing laws and regulations already address the leading causes of pipeline failure, including corrosion, materials and equipment failures, and operations errors. If investigations unexpectedly identify any gaps, we are ready to work with you to address them.

We were pleased to see the Senate Commerce Committee advance Pipeline Safety Reauthorization as 275, which passed the committee unanimously. The bill is a positive step forward, although we do not agree with every provision. My written testimony covers a number of recommendations.

We call your attention to Section 3, which would essentially require PHMSA to prohibit one-call exemptions for state and local governments and their contractors. It is a great start. We urge this committee and the House to go further by eliminating still more exemptions for mechanized excavators. Third-party damage is less frequent today but it is still the leading cause of accidents that kill or injure people. In some cases, state laws requiring the use of 8-1-1, the national call-before-you-dig number, exempts state agencies, municipalities, or other entities such as railroads from requirements to use the one-call system. These exemptions create a gap in enforcement and safety. The pipeline does not care who hits it.

PHMSA can close the gap by exercising one-call civil enforcement authority granted by Congress in 2006. PHMSA can induct enforcement proceedings for a one-call violation within the boundary of a State if the secretary has determined that the State's plan or enforcement is inadequate to protect safety. The draft PHMSA rulemaking on this issue is a great start but does not go far enough on ending these exemptions. We urge DOT to complete its rulemaking soon and urge Congress to require PHMSA to terminate these exemptions.

We also applaud the provision in S. 275 to bring some of PHMSA's pipeline procedural rules up to par with those used by other regulatory agencies, including elsewhere at DOT. Requiring an impartial presiding officer to conduct hearings and allowing access to a hearing transcript are basic elements of due process we support. We encourage the Congress to go further by also requiring a separation of function of PHMSA staff to help ensure impartiality. Also, Congress should require PHMSA to allow timely hearings to review corrective action orders after they are issued.

We are glad PHMSA may implement some of these safeguards administratively, but we know that they are reversible unless codified by Congress. We look forward to working with Congress, PHMSA, the Pipeline Safety Trust, and others to continue pipeline safety gains, and we authorize the pipeline safety laws. Thank you.

[The prepared statement of Mr. Black follows:]

**Testimony of
Andrew J. Black
on Behalf of the
Association of Oil Pipe Lines (AOPL) and the American Petroleum Institute (API)**

**Before the House Committee on Energy and Commerce
Subcommittee on Energy and Power**

June 16, 2011



The Association of Oil Pipe Lines
1808 Eye Street, NW
Suite 300
Washington, DC 20006
202-408-7970 phone
www.aopl.org



The American Petroleum Institute
1220 L Street, NW
Washington, DC 20005-4070
202-682-8000 phone
www.api.org

Summary

Pipelines are the safest and most efficient way to move crude oil and refined petroleum products such as gasoline, diesel fuel, jet fuel, home heating oil and propane. The safety record of the liquid pipeline industry shows strong improvement over the past decade, because of new laws and regulations, improving technologies, and vigorous industry action. Each of the major causes of pipeline accidents also showed marked decreases during this time period. Pipeline operators pursue continuous improvement by sharing best practices and information about incidents and near misses, conducting research, and making technically based recommendations to industry leaders.

Pipeline operators take safety seriously. Operators of liquid pipelines invest millions of dollars annually to maintain their pipelines and comply with federal pipeline safety laws and regulations. Improved tool technology and greater experience with data integration has resulted in operators and vendors detecting anomalies not found in earlier tool runs. While catching these anomalies before they go to failure is a positive outcome, it means that the costs of integrity management remain high, a situation we expect to continue for the foreseeable future. Costs for conducting integrity management incurred by pipeline operators are ultimately borne by the shippers who pay for transportation services and the consumers of the products that are shipped through the pipeline.

Congress has provided PHMSA with broad authority to regulate pipeline safety. PHMSA is an aggressive regulator, conducting rigorous inspections and vigorously enforcing compliance with pipeline safety laws. Operators face a comprehensive set of federal regulatory requirements for construction, operation, and maintenance of pipelines. Existing laws and regulations already address the leading causes of pipeline failures, including corrosion, excavation damage, materials and equipment failure, and operations. AOPL and API have proposed additional requirements on liquid pipeline operators regarding repair criteria, leak detection evaluations, and a systematic updating of High Consequence Area designations.

AOPL and API ask for the help of Congress to protect pipelines from excavation damage, the leading cause of accidents which kill or injure people. Exemptions from One-Call requirements in State programs create a safety gap which must be closed. PHMSA should close the gap by exercising One Call Civil Enforcement authority granted by Congress in 2006. Congress should require PHMSA to terminate these State exemptions.

AOPL and API also encourage Congress to bring PHMSA's procedural rules up to par with those used by other regulatory agencies. AOPL and API also recommend that Congress not expand PHMSA jurisdiction or require rulemakings before receiving studies that assess whether the current regulatory framework is adequate.

AOPL and API are ready to work with Congress, PHMSA, and other stakeholders on these and other issues to continue pipeline safety gains and reauthorize the pipeline safety laws.

Introduction

I am Andy Black, President and CEO of the Association of Oil Pipe Lines (AOPL). I appreciate this opportunity to appear before the subcommittee today on behalf of AOPL and the American Petroleum Institute (API).

AOPL is an incorporated trade association representing 49 liquid pipeline transmission companies. The American Petroleum Institute (API) represents more than 470 oil and natural gas companies, leaders of a technology-driven industry that supplies most of America's energy, supports more than 9.2 million U.S. jobs, accounts for 7.7 percent of the U.S. economy, and delivers more than \$85 billion a day in revenue to the U.S. Treasury. Together, our organizations represent the operators of approximately 90 percent of total U.S. oil pipeline mileage in the United States.

I will discuss the industry's commitment to safety, our improving safety record, and our views on pipeline safety reauthorization.

Liquid pipelines overview

Pipelines are the safest, most reliable, economical and environmentally favorable way to transport oil and petroleum products, other energy liquids, and chemicals, throughout the U.S.

Liquid pipelines bring crude oil to the nation's refineries and petroleum products to our communities, including all grades of gasoline, diesel, jet fuel, home heating oil, kerosene, and propane. AOPL's and API's member companies provide hydrocarbon feedstocks for use by many other industries, including food, pharmaceuticals, plastics, chemicals, and road construction. America depends on the network of more than 170,000 miles of liquid pipelines to safely and efficiently move the energy that fuels our nation's economic engine.

Approximately 2.5 cents of the cost of a gallon of gasoline to an end-user can be attributed to pipeline transportation¹, resulting in a low and predictable price for pipeline customers (referred to as “shippers”). Liquid pipeline transportation rates are regulated by the Federal Energy Regulatory Commission (FERC). Rates are generally stable and predictable, and do not fluctuate with changes in crude oil, gasoline, or other fuel prices.

Pipeline operators insist on safety

Pipeline operators have every incentive to invest in safety. Indeed, in our members’ view, there are no incentives to cut corners on pipeline safety. Most important is the potential for injury or loss of life to members of the public, pipeline employees and contractors, and the effect on the environment. In addition to the public and third-party impact, if a pipeline experiences a failure or a release, there are numerous potentially harmful consequences for the operator and its reputation. The operator could incur potentially costly repairs, cleanup costs, litigation, and fines. Further, the pipeline could suffer a significant loss of revenue and goodwill by not being able to serve its customers for extended periods of time. In short, when it comes to safety, pipeline operators have every reason to operate in a manner consistent with the public interest.

Operators of liquid pipelines invest millions of dollars annually to maintain their pipelines and comply with federal pipeline safety laws and regulations. A large percentage of liquid pipeline assets are inspected regularly and all are monitored continuously. Safety measures include proper pipeline route selection, design, construction, operation, and maintenance, as well as comprehensive public awareness and excavation damage prevention programs.

¹ “Liquid Transportation Fuels from Coal and Biomass: Technological Status, Costs, and Environmental Impacts”, National Academy of Sciences, 2009.

As a result of industry actions and pipeline safety rules and regulations, liquid pipeline spills along rights-of-way have decreased significantly over the past decade, in terms of both the number of spills and the volume of product released. Both industry and government continue to work to improve this record further.

Pipeline safety laws and regulations

Congress enacted the Hazardous Liquids Pipeline Safety Act of 1979 (HLPESA, 49 U.S.C. 2001) to regulate comprehensively the transportation of liquids by pipeline. Since then, several new laws have been passed affecting the regulation of the liquids pipeline industry, including: the Pipeline Safety Act (PSA) of 1994, the Pipeline Safety Improvement Act of 2002 (PSIA), and the Pipeline Inspection Protection, Enforcement, and Safety Act of 2006 (PIPES).

Pipeline safety is closely regulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA is responsible for establishing and enforcing regulations to assure the safety of liquid pipelines (Title 49 CFR Parts 190-199). Operators face a rigorous set of PHMSA regulations pertaining to pipeline construction, operation, and maintenance. Regulations also cover public awareness, reporting, design standards, construction methods, operational controls and limitations, pressure testing, maintenance standards, qualification of personnel, and emergency response. Laws and regulations address the leading causes of pipeline failures, including corrosion, excavation damage, materials and equipment failure, and operations.

Integrity management

Pipeline operators are required under federal regulations (Title 49 CFR, Part 195.450 and 452) to develop an Integrity Management Plan (IMP), for pipeline segments which could affect High Consequence Areas (HCAs). HCAs for liquid pipelines include any of the following:

- Population centers, urbanized areas, or areas with large population density;
- Commercially navigable waters; and
- Unusually sensitive areas such as areas proximate to water supplies and ecological reserves.

Liquid pipeline operators are required in their IMPs to identify pipeline segments that could impact HCAs, conduct periodic integrity assessments on those segments at intervals not to exceed five years, and review assessment results to make mitigation and repair decisions. When identifying segments which could affect HCAs, operators are required to conduct risk assessments and consider local topographical characteristics, operational and design characteristics of the pipeline, and the properties of transported commodities in determining potential impacts of an incident. These assessments set a point of comparison so that operators may gauge the impact of time-dependent threats, like corrosion. This is an extra layer of oversight based on the fact that the consequences of a release are potentially greater if there is an impact on an HCA. Many operators use these same assessment techniques on non-HCA pipeline segments. Liquid pipeline baseline assessments for pipelines that could affect HCAs were completed for existing pipelines by March 2008. Operators are now on their second or third round of assessments.

Assessments include in-line inspection by “smart pigs”, which detect features in the pipe that need to be addressed, such as corrosion, pipe deformation, cracking and other anomalous features. This technology includes sensitive internal detection devices, such as magnetic flux leakage tools (MFL) and ultrasonic testing, to examine pipeline wall thickness and detect other anomalies. Another widely-used assessment method is hydrostatic pressure-testing, where a pipeline segment is filled with water, pressurized, and monitored to assure it will hold pressure at a safety factor well above the intended operating pressure.

As in-line inspection tools become more sophisticated, they are more effective at identifying anomalous conditions for pipeline operators to consider, resulting in increased costs incurred by pipeline operators. Integrity management compliance costs have trended upward since implementation of the IMP regulations, a trend that the industry expects to continue in the coming years. Liquid pipeline operators representing approximately 75 percent of the PHMSA-regulated pipeline mileage report spending approximately \$2.7 billion on pipeline integrity management activities, and approximately \$600 million on integrity management related to pipeline-owned tankage, from 2004 to 2009. The costs for conducting integrity management are incurred by pipeline operators, and are ultimately paid for by the pipelines' shippers and the consumers of the products that are shipped.

Liquid pipeline safety record has improved

The frequency of releases from liquid pipelines decreased from 2 incidents per thousand miles transported in 1999-2001 to 0.8 incidents per thousand miles in 2007-2009, a decline of 59 percent. Similarly, the number of barrels released per thousand miles decreased from 629 in 1999-2001 to 364 in 2007-2009, a decline of 41 percent². The industry is proud of its improvement to date, but continues to strive for zero releases, zero injuries, zero fatalities and no operational interruptions.

Each of the major causes of pipeline accidents showed decreases during this time period, reflecting the success of several different strategies to manage risk.

<i>Cause</i>	<i>Decrease from 2001 to 2009 (3-year averages)</i>
Corrosion	73 percent

² These figures are from the Industry's Pipeline Performance Tracking System, an industry-led reporting system that tracks pipeline system spills.

Third-party damage (excavation or other mechanical damage)	66 percent
Equipment	50 percent
Pipe materials and seams	30 percent
Operator error	40 percent

Furthermore, releases due to time-dependent causes (those that occur or worsen over time) were reduced by 36 percent from 2002-2009. Those trend line reductions were even greater for large releases (down 50 percent) and releases on pipes installed before 1950 (down 83 percent).³ If properly constructed, maintained, and protected, pipelines should have extraordinarily long lives. Old age in a pipeline does not automatically mean a pipeline segment should be replaced or is unsafe. A more accurate determination of a pipe's integrity is its "fitness for service", not simply its age. Operators choose tools to use in inspecting and maintaining a pipeline using several factors, including the type of pipe, its constructions, and its operating history.

Performance Improvement

We continue to work hard at the company and association level to achieve the goal of zero releases. Since 2001, the vision of AOPL and API member companies has been an oil pipeline industry that –

- Conducts operations safely and with respect for the environment, with zero deaths, injuries, or releases;
- Respects the privilege to operate granted to it by the public; and
- Provides reliable transportation of the crude oil and refined products upon which America and all Americans rely.

We have committed to fulfill this vision by:

³ PHMSA Form F 7000-1 data (2002-2009) on time-dependent causes.

1. Supporting effective federal oversight of pipeline operations in cooperation with states and local communities;
2. Promoting cooperation among communities, public officials, employees and companies by sharing information on pipelines and pipeline safety;
3. Employing proven pipeline safety technologies and investing in new technologies to further improve performance; and
4. Achieving operational excellence through sound risk management approaches.

After the 1999 pipeline accident in Bellingham, Washington, the U.S. oil pipeline industry created the Environmental and Safety Initiative (ESI) to push ourselves to make further improvements in spill and accident prevention. Led by pipeline executives, the ESI promotes achievement of operational excellence through promotion of sound risk management approaches, sharing of best practices, implementation of proven pipeline safety technologies, and investment in new technologies. Company executives have extensive discussions on safety during industry leadership meetings, share effective safety policies and programs, discuss topics of concern and approaches to improvement, and reinforce the industry's commitment to safety.

The Performance Excellence Team (PET) of the ESI pursues environmental and safety excellence in operations and system integrity. PET promotes inter-company learning and high quality, accurate and useful data analysis leading to actionable recommendations to the pipeline industry for continuous performance improvement. PET members from operations, engineering, regulatory compliance, and environment, health and safety, meet regularly to share information and best practices.

The liquid pipeline industry is focused on continuous learning and improvement. Toward this end, the industry collects and carefully analyzes data on pipeline spills. Every spill of at least five gallons is reported to the U.S. Department of Transportation, and operators contribute more detailed spill data to the Pipeline Performance Tracking System (PPTS). The stated philosophy of PPTS is to measure, learn, manage and improve. Through PPTS, the industry measures and

evaluates its performance and focuses on areas for improvement. PPTS data helps provide actionable recommendations to the pipeline industry targeting continuous performance improvement and solutions addressing the known and anticipated challenges.

Hazardous liquids pipeline employees also participate in the annual Pipeline Information Exchange (PIX) workshop, a confidential forum in which operators can share learning opportunities from specific pipeline incidents or near misses. Attendees include control room operators, safety managers, engineering and integrity staff and executives. The objective is for participants to take these learnings back to their respective companies to help prevent similar situations from occurring.

Finally, pipeline operators invest in research to identify new technologies and practices to improve pipeline safety. In addition to company research, pipeline operators, AOPL, API and others fund research conducted by Pipeline Research Council International (PRCI), a global cooperative R&D organization for the energy pipeline industry. PRCI members contribute technical and operations experts from their companies to work with expert consultants, maintain a research forum of ideas, and produce tangible solutions companies can implement. Over the last five years, liquid and natural gas pipelines contributed more than \$39 million toward PRCI pipeline research.

PHMSA ANPRM for Hazardous Liquid Lines

On February 18, 2011, AOPL and API provided comments in response to PHMSA's Advanced Notice of Proposed Rulemaking (ANPRM) for hazardous liquid pipeline safety (Docket # PHMSA-2010-0229). AOPL and API proposed several new regulatory requirements to improve pipeline safety.

Repair Criteria for Non-HCA Segments – AOPL and API proposed that PHMSA require liquid pipeline operators to treat all pipeline anomalies identified as “immediate repairs” in PHMSA’s integrity management repair criteria regulations the same regardless of whether they could affect an HCA. This concept would capture a significant portion of the nation’s total liquid pipeline mileage. A recent survey conducted by API of its member pipeline companies (covering 93,867 miles) showed that through the course of assessing HCA “could-affect” segments, operators had assessed 83 percent of their non-HCA mileage. When combined with HCA mileage, this represents 90 percent of the total mileage for the survey respondents. This is a significant step forward and voluntarily expands the current regulatory requirements that trigger immediate response only for pipeline segments which could affect an HCA.

Leak Detection – AOPL and API proposed that PHMSA expand leak detection capability evaluations to all pipelines currently subject to PHMSA’s regulations, except rural gathering lines.

Current Criteria for HCA Designation – AOPL and API proposed PHMSA regularly update HCA determinations and boundaries to reflect census population data from the decennial census and updated water intake information.

Damage prevention and One-Call

Excavation damage to pipelines is the leading cause of pipeline accidents which kill or injure people. Excavation accidents are less frequent today, but often still result in extremely adverse consequences. Incidents from excavation damage by third parties accounted for only 7 percent of release incidents from 1999 to 2008. However, 31 percent of all significant incidents (those that result in spills of 50 barrels or more, fire, explosion, evacuation, injury or death) are caused by third-party excavation damage. Further, at an even higher frequency, pipelines suffer

damages from third parties that contribute to accidents later, are not severe enough to cause a release at the time the pipeline is struck.

To protect communities, sensitive environmental areas, as well as the pipeline itself, the pipeline industry and other operators of underground facilities joined together to create notification centers that are used by those preparing to conduct excavation close to underground facilities. These “One-Call Centers” serve as the clearinghouse for excavation activities that are planned close to pipelines and other underground utilities.

Established by Congress in 2007, 811 is the national “call-before-you-dig” number which informs operators when someone wants to dig near the pipeline, and homeowners, and excavators about the location of underground utilities before they dig to prevent unintentional damage to underground infrastructure, including pipelines. When calling 811 from anywhere in the country, a call is routed to the local One-Call Center. Local One-Call Center operators identify the location of the proposed excavation and route information about the proposed excavation to affected infrastructure companies. Under One-Call regulations, excavators must wait a specified amount of time before beginning any excavation project, to allow operators of underground infrastructure time to locate and mark underground infrastructure to protect it from excavation-related damage.

In addition, pipeline operators, associations, state regulators and federal and state agencies take part in the Common Ground Alliance (CGA), an association that promotes effective damage prevention practices for all underground utility industry stakeholders to ensure public safety, environmental protection, public awareness and education to guard against excavation damage. Industry has worked closely with CGA to develop best practices and

participates fully in its damage prevention programs, including the establishment and implementation of 811 programs.

The need for improved damage prevention enforcement

We believe more must be done to encourage adherence to state damage prevention laws and strengthen state and national programs already in place. We recognize and support the role of the states in preventing damage to pipelines. However, in some cases, state excavation damage prevention laws are weak or incomplete, or are not adequately enforced. In many states, state agencies, municipalities and other local entities are exempted from requirements to use the One-Call system before they undertake excavation activities. These exemptions create a gap in enforcement and safety, because the threat and impact of pipeline damage is the same regardless of the excavator's identity or affiliation.

PHMSA could close the gap by exercising its One Call Civil Enforcement authority as modified by Section 2 of the PIPES Act of 2006 (Public Law 109-468). The Secretary of Transportation has authority to conduct enforcement proceedings for a violation within the boundaries of a state if the Secretary "has determined that the State's enforcement is inadequate to protect safety" after the Secretary "issues, through a rulemaking proceeding, the procedures for determining inadequate State enforcement of penalties."

PHMSA commenced an Advanced Notice of Proposed Rulemaking (ANPRM) in October 2009 to assess state damage prevention programs.⁴ Under the proposed rule, PHMSA would assess a state's damage prevention program and make the determinations of adequacy or

⁴ 74 Fed. Reg. 55797-55803; October 29, 2009; Pipeline Safety: Pipeline Damage Prevention Programs; Advance notice of proposed rulemaking; Docket #: PHMSA-2009-0192

inadequacy called for by Congress. AOPL and API support the spirit of the proposal, and recommend PHMSA go further toward protecting the public and environment from pipeline accidents caused by excavation damage. As AOPL and API commented in the rulemaking,⁵ we recommend that, as a minimum requirement in a state damage prevention program, all excavators, including state agencies and municipalities:

- (1) use state One-Call systems prior to excavation;
- (2) follow location information or markings established by pipeline operators;
- (3) report all excavation damage to pipeline operators; and
- (4) immediately notify emergency responders when excavation damage results in a release of pipeline products.

Congress has already given the Department of Transportation the authority to close the safety gap caused by state-granted exemptions to One-Call damage prevention laws. We believe PHMSA should use that authority to close that gap. We also believe Congress should consider directing PHMSA to close this safety gap expeditiously, by requiring timely promulgation of a final rule effectively prohibiting One-Call exemptions for mechanized excavators. We recommend PHMSA move forward soon with a final rule, as it has been nearly 20 months since it issued the ANPRM, to promote more effective and streamlined damage prevention rules that will promote safety and greater awareness of pipeline right-of-ways. We support more aggressive enforcement, recognizing it will apply equally to pipeline operators should they fail to adhere to excavation damage prevention laws.

Pipeline safety reauthorization

AOPL and API are ready to work with Congress, PHMSA, and stakeholders to reauthorize pipeline safety laws. We believe Congress should recognize the success of

⁵ December 14, 2009 letter to Jeffrey D. Wiese regarding 74 FR 55797 (October 29, 2009).

PHMSA's performance-based regulatory system, and continue to provide the agency with the flexibility to propose and enforce common-sense safety regulations using its technical judgment. PHMSA already has broad authority, a strong set of enforcement tools and a full suite of existing regulations, some of which are just now being implemented, to effectively regulate the safety of liquid pipelines. PHMSA regulations already address the major causes of transmission pipeline failures.

We would urge Congress not to make drastic revisions to a regulatory model that is driving down the number of releases from pipelines. It would be premature to suggest that any recent incident means current safety regulations need to be changed, let alone to know what those changes should be. Nothing has been suggested in preliminary findings that the causes of accidents in San Bruno, California or Marshall, Michigan were the result of a gap in existing federal laws and regulations. Our members await the findings of the National Transportation Safety Board (NTSB) regarding pipeline incidents under investigation, so that they may implement any learnings. We commit to work with NTSB, PHMSA, and Congress should the findings unexpectedly identify any regulatory gaps.

On May 5, 2011, the Senate Committee on Commerce, Science, and Transportation ordered S.275, the Pipeline Transportation Safety Improvement Act, to be reported to the full Senate. AOPL and API believe the bill, which achieved bipartisan support, is a constructive step forward on pipeline safety reauthorization. S.275 would make significant strides to improve weak and ineffective State Damage Prevention Programs and prevent excavation damage. Section 3 specifically prevents states from exempting state agencies, municipal governments, and their contractors from One-Call notification requirements. While there are aspects of the legislation that need improvement, including Section 3, AOPL and API urge the Senate to

approve S. 275 and the House to complete pipeline safety reauthorization legislation this year.

We point out below AOPL's and API's priorities for this legislation.

Policy Suggestions Moving Forward

Damage Prevention – Congress should require PHMSA to remove all exemptions in State Damage Prevention Programs for mechanized excavation. Such exemptions pose an unnecessary safety risk to the public and the environment.

Due Process – AOPL and API believe Congress should ensure that pipeline operators are afforded basic legal protections found at other federal agencies, such as FERC, during PHMSA enforcement proceedings, particularly if maximum civil penalties are increased. If Congress determines to raise substantially the maximum civil penalties that PHMSA may impose, the procedural rules that PHMSA must follow when using its enforcement authority also should be updated. S.275 would make a good start toward implementing basic procedural reforms and greater transparency in the PHMSA enforcement decision-making process. However, we suggest the addition of provisions to:

1. allow timely formal hearings to review Corrective Action Orders (CAO) after they have been issued; and,
2. require a separation of functions between PHMSA's investigative/prosecutorial staff and advisory/decisional staff.

These procedural protections are commonly provided by other regulators like FERC and the NRC. There is no reason to deny the pipeline industry similar protections. We understand that PHMSA may implement some of these safeguards administratively. We encourage PHMSA to do this, but note that they are reversible unless codified by Congress and the timing of such procedural reforms is uncertain.

Offshore Gathering Pipelines –Gathering lines are very small pipelines generally associated with production, not transmission. They are usually from 2 to 8 inches in diameter, gather oil from many wells and connect to storage facilities or larger trunk lines measuring from 8 to 24 inches in diameter. Many of these offshore lines are located in State waters, may be regulated by the States, and are not part of the interstate movement of petroleum products. Also, gathering lines must comply with EPA regulation under the Clean Water Act. These lines are appropriately suited for existing regulation, not additional federal regulation for transmission pipelines. The existing regulatory framework has worked effectively. If Congress decides to expand PHMSA’s reach into offshore gathering pipelines, we would urge Congress and PHMSA to use significant care. Many gathering lines are not large enough for the use of “smart pigs”. In addition, an overly burdensome regulatory approach that does not take into account the unique operating characteristics of the marine environment could cause gathering lines to become uneconomic, shutting in significant supply.

Leak Detection Mandates – S. 275 would require a study of leak detection technologies for liquids pipelines, which we do not oppose. A study issued in December 2007, pursuant to a prior Congressional mandate in the 2006 PIPES Act, demonstrated the complexity of leak detection technologies and applications, and did not recommend a one-size-fits-all mandate. Such a mandate would not take into account the complex operational characteristics of pipeline systems and could lead to false alarms and unnecessary shutdowns. S. 275 *requires* a PHMSA rulemaking regarding leak detection technologies “as appropriate”, *regardless of the findings of the study*. We believe PHMSA should have the flexibility to determine whether any new information about leak detection systems is available and whether further steps are necessary

regarding leak detection, instead of being required to conduct a rulemaking. Accordingly, AOPL and API oppose the requirement for a PHMSA rulemaking on leak detection.

AOPL and API believe the important places to focus concerns about leak detection are on system-specific leak detection capability evaluations and technological advances. As mentioned previously, AOPL and API proposed that PHMSA require pipeline operators to perform leak detection capability evaluations on PHMSA-regulated liquid transmission pipeline systems. AOPL, API, and their members also support research into leak detection technologies.

Conclusion

In closing, we very much appreciate the opportunity to testify today and share our views. We are prepared to work with this Committee and others with jurisdiction, the Administration, and other stakeholders interested in advancing the shared goal of an effective and efficient pipeline safety reauthorization bill. I am happy to answer any questions that Members of the Committee may have.

Mr. WHITFIELD. Thank you, Mr. Black. Mr. Weimer, you are recognized for 5 minutes.

STATEMENT OF CARL WEIMER

Mr. WEIMER. Good morning, Chairman Whitfield and Upton, and Ranking Member Waxman and members of the subcommittee. Thank you for inviting me to speak today on the important subject of pipeline safety.

The Pipeline Safety Trust came into being after a pipeline disaster in Bellingham, Washington that occurred 12 years ago which left 3 young people dead, wiped out every living thing in a beautiful salmon stream, and caused millions of dollars of economic disruption. Borne from that tragedy and other tragedies in places like Edison, New Jersey; Carlsbad, New Mexico; and Walnut Creek, California, we have testified to Congress for years about the improvements needed in regulations to help prevent more disasters.

For years we have talked about the need for more miles of pipelines to be inspected by smart pigs. We have pleaded for clear standards for leak detection and the placement of automated shut-off valves, closing the loopholes that allow some pipelines to remain unregulated, and for better information to be available so people know if they live near a large pipeline.

So here we are again after new tragedies in Marshall, Michigan; San Bruno, California; and Allentown, Pennsylvania asking for the same things we have asked for at other hearings following previous tragedies. We are pleased to see some of our recommendations included in part of the legislation recently passed unanimously by the Senate Commerce Committee, and we hope this body will build on that legislation to provide an even stronger, more comprehensive bill. It is our sincere desire not to be back here again in the future saying the same things after yet another disaster.

Pipeline safety should be an easy task. The pipeline industry, regulators, and citizen groups all agree that safety is Job 1. Every trade association has come out with some statement that the highest priority is no deaths, no injuries, and zero incidents. So if we all agree that zero incidents is the goal, then let us look at what changes in the rules can get us to zero.

Clearly, providing PHMSA and the States with more funding and personnel so they can better inspect industry efforts and analyze safety needs should move us towards zero incidents, so we all should support that. Since integrity management requirements were passed nearly 10 years ago, more than 34,000 flaws were found in pipelines and repaired, reducing the possibilities of many failures. Since 75 percent of all the deaths caused by the failures of transmission pipelines have occurred in areas that fall outside of the current integrity management requirements and only 7 percent of the gas pipelines and only 44 percent of liquid pipelines fall under these inspection requirements. It is clear we could reduce incidents by requiring integrity management inspections on all miles of these pipelines.

We are glad that INGAA in their recently-released new set of guiding principles commits to "applying integrity management principles on a system-wide basis." Likewise, any pipelines near people should be required to operate in such a way that prevents

failures. Unfortunately, with the rapid expansion of new shale gas drilling in more populated areas, there are now hundreds of thousands of miles of gas gathering lines that are under-regulated or not regulated at all. Many of these lines are the same size and pressure as transmission pipelines. Clearly, if our priority is safety, then these gathering lines need to fall under the same safety regulations as other similar pipelines.

If zero is our goal, then state agencies need to continue to be pushed to move to improve their pipeline damage prevention laws, and the efforts of state pipeline safety agencies need to be clearly evaluated and those evaluations shared with the public. If safety is our highest priority, then the disconnect that exists between the agencies that cite new pipelines and PHMSA, the Agency in charge of pipeline safety, needs to be corrected. PHMSA needs to have the authority and the resources necessary to engage in safety reviews as these pipelines are planned and to inspect them thoroughly as they are going into the ground.

And if getting to zero incidents is really our priority, then local governments who have zoning and permitting authority regarding land uses near pipelines need to be engaged actively in these pipeline safety discussions since more and more development is encroaching near these big pipelines.

NTSB's recommendation that companies can clearly document that the operating pressure they run their transmission pipelines at is based on real knowledge of what is in the ground needs to be adopted. Also requirements for excess flow valve installation on appropriate multi-family and commercial applications needs to be moved forward.

I see my time is about up so let me close by saying that there are many things that clearly can be done to make pipelines safer. We have outlined many of those specific ideas in our written testimony. Many of the leaks, spills, and injuries and deaths that are still occurring are preventable. Instead of just saying getting to zero is our highest priority, we all need to start doing things that will actually get us there. You have the opportunity this year with this legislation to help guide us all towards zero incidents. We hope you seize that opportunity and help hold us all to our fine talk.

Thank you.

[The prepared statement of Mr. Weimer follows:]



**TESTIMONY OF
THE PIPELINE SAFETY TRUST**

**1155 North State Street, Suite 609
Bellingham, WA 98225
(360) 543-5686
<http://www.pipelinesafetytrust.org>**

Presented by:

Carl Weimer, Executive Director

**BEFORE THE
SUBCOMMITTEE ON ENERGY AND POWER
OF THE
COMMITTEE ON ENERGY AND COMMERCE
UNITED STATES HOUSE OF REPRESENTATIVES**

**HEARING ON
PIPELINE SAFETY OVERSIGHT**

JUNE 16, 2011

Good morning, Chairman Whitfield, Ranking Member Rush and members of the Subcommittee. Thank you for inviting me to speak today on the important subject of pipeline safety. My name is Carl Weimer and I am testifying today as the Executive Director of the Pipeline Safety Trust. I am also a member of the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Technical Hazardous Liquid Pipeline Safety Standard Committee, as well as a member of the steering committee for PHMSA's Pipelines and Informed Planning Alliance. I also serve on the Governor-appointed Washington State Citizens Committee on Pipeline Safety, and bring a local government perspective to these discussions as an elected member of the Whatcom County Council in Washington State.

The Pipeline Safety Trust came into being after a pipeline disaster that occurred twelve years ago last Friday. The 1999 Olympic Pipeline tragedy in Bellingham, Washington left three young people dead, wiped out every living thing in a beautiful salmon stream, and caused millions of dollars of economic disruption. While prosecuting that incident the U.S. Justice Department was so aghast at the way the pipeline company had operated and maintained their pipeline, and equally aghast at the lack of oversight from federal regulators, that they asked the federal courts to set aside money from the settlement of that case to create the Pipeline Safety Trust as an independent national watchdog organization over both the industry and the regulators. We have been trying to fulfill that vision ever since, but the spate of recent disasters makes us question whether our message is being heard.

Born from a tragedy in Bellingham, but also riding on the emotion and facts of other tragedies in places like Edison, New Jersey; Carlsbad, New Mexico; Walnut Creek, California and Carmichael, Mississippi we have testified to Congress for years about the improvements needed in federal regulations to help prevent more such tragedies. For years we have talked about the need for more miles of pipelines to be inspected by smart pigs. We have pleaded for clear standards for leak detection, requirements for the placement of automated shut off valves, closing the loopholes that allow some pipelines to remain unregulated, and for better information to be available so innocent people will know if they live near a large pipeline and whether that pipeline is maintained and inspected in a way to ensure their safety.

So here we are again after the most recent tragedies in Marshall, Michigan, San Bruno, California and Allentown, Pennsylvania asking for the same things we have asked for in

previous hearings following previous tragedies. We are pleased to see some of our recommendations included as part of legislation recently passed unanimously by the Senate Committee on Commerce, Science and Transportation, and we hope this body will build on that legislation to provide an even stronger more comprehensive bill. It is our sincere desire not to be back here again in the future saying the same things after yet another tragedy.

The vision of the Pipeline Safety Trust is simple. We believe that communities should feel safe when pipelines run through them, and trust that their government is proactively working to prevent pipeline hazards. We believe that local communities who have the most to lose if a pipeline fails should be included in discussions of how best to prevent pipeline failures. And we believe that only when trusted partnerships among pipeline companies, government, communities, and safety advocates are formed, will pipelines truly be safer.

In my testimony this morning I will cover the following areas that are still in need of improvement:

- **Expanding the miles of pipelines that fall under the Integrity Management rules**
- **Requiring automated shut off valves for gas and liquid transmission pipelines**
- **Developing and implementing enhanced standards and requirements for leak detection on hazardous liquid lines**
- **Regulating gas gathering pipelines**
- **Regulating unregulated liquid pipelines**
- **Correcting the pipeline siting vs. safety disconnect, and ensuring PHMSA's ability to provide inspections when pipelines are being constructed**
- **Continuing to push state agencies on damage prevention**
- **Implementing the Pipelines and Informed Planning Alliance (PIPA) recommendations**
- **Continuing implementation and funding of Technical Assistance Grants to Communities**
- **Continuing to make more pipeline safety information publicly available**
- **Making public awareness programs meaningful and measurable**
- **Implementing expansion of Excess Flow Valve requirements**
- **Concerns with industry developed standards being incorporated into federal regulations**

Expanding the miles of pipelines that fall under the Integrity Management rules

In response to horrific pipeline tragedies, Congress required integrity management in High Consequence Areas (HCAs) as a way to protect the people who live, work and play near pipelines, as well to protect sensitive environmental areas and this nation's critical energy infrastructure. Before integrity management, a pipeline company could install a pipeline transporting huge quantities of often explosive fuel and leave it uninspected indefinitely – even for 50, 60, or 70 years. Even today only 7% of natural gas transmission pipelines and 44% of hazardous liquid pipelines fall under these important inspection programs.

Since these rules began to be implemented in 2001, over 75% of all the deaths caused by these types of pipelines have occurred in areas that fall outside of the current integrity management requirements, and more than 34,000 anomalies found in High Consequence Areas have been repaired based on integrity management requirements. Yet these requirements do not apply to the vast majority of pipelines in rural areas, and people who live, work or play near pipelines in these rural areas interpret this to mean that Congress and PHMSA have decided their lives are not worth protecting with these important integrity management rules.

The current concept of requiring integrity management programs only for pipelines in High Consequence Areas is also not sufficiently protective of America's economy. Regardless of where a pipeline fails, there will be a significant economic impact on the downstream markets. For instance, when the El Paso natural gas pipeline failed in 2000 in a non-High Consequence Area, the staff of the Federal Energy Regulatory Commission estimated that the restriction in gas supply cost the people of California hundreds of millions of dollars. Every time a major liquid pipeline serving a refinery goes down the price of gasoline in the region skyrockets until the pipeline can be repaired and supplies returned to normal. Congress experienced this not too long ago when a BP pipeline in Alaska failed from corrosion and the American people paid millions of dollars in higher gas prices. When it comes to consumer's pocketbooks, and the welfare of the economy, every mile of pipeline is of high consequence, so every mile should be inspected so that the American people have reliable and safe pipeline infrastructure.

Many progressive pipeline operators already apply integrity management rules to significantly more miles of their pipelines than required by federal regulations. These companies do this because they think it is good business, and we couldn't agree more. Unfortunately not all

companies voluntarily provide these needed safety precautions, and even those that do are not required to respond to the problems found, as they would be if these areas were covered by the integrity management rules. Recently the Interstate Natural Gas Association of America (INGAA) released a new set of “Guiding Principles”¹ one of which commits them to “applying integrity management principles on a system-wide basis.” We are thrilled with INGAA’s agreement with us on the need to expand integrity management to entire pipeline systems, and now we all need to work to define what that means.

For these reasons the Trust asks that you direct PHMSA to initiate a rulemaking by a date certain to implement a similar Integrity Management program on all transmission pipelines that fall outside of current HCAs.

Concerns with possible changes to Integrity Management

Since nearly the time integrity management was passed for natural gas transmission pipelines as part of the Pipeline Safety Improvement Act of 2002 some within the natural gas industry have lobbied for a relaxation of the seven year re-inspection interval that Congress set. The Pipeline Safety Trust opposes any relaxation of this re-inspection interval for the following reasons:

1. The baseline inspection period has not even been reached yet, and we believe that it is necessary to go through two or three re-inspections to determine whether the system is actually working and if it makes sense to change the re-inspection interval. Some companies have not even completed one round of inspections yet. During the first round many anomalies with the pipelines were identified and repaired. Subsequent rounds of inspections should tell us how quickly new anomalies appear and at what rates they are growing. Without that information from ongoing re-inspections it is too early to propose changing the re-inspection interval.
2. The industry also argues that instead of a standard re-inspection interval that would allow all companies’ results to be compared, each company, based on its own internal findings, should be allowed to design its own re-inspection program for each individual segment of its pipelines. This engineered, risk-based approach may be feasible, but it places much of the authority to draft the requirements with each company, and we question whether PHMSA and state regulators have the extensive resources necessary to

¹ <http://www.ingaa.org/cms/6211/11460.aspx>

review each program to ensure it is no less protective than the current seven-year re-inspection intervals. This proposed system also includes no way for the public to review and comment on the proposed engineered risk-based re-inspection proposals.

3. There is also increasing mileage of large high-pressure natural gas pipelines in areas with very high-density populations. The consequences if one of these pipelines should fail in such an area would be catastrophic. Before there is any consideration to changes in the re-inspection interval for these types of natural gas pipelines, PHMSA should reassess the safety protocols in place to ensure that it is impossible for a pipeline to fail in such an area from any cause that is within the operator's controls (corrosion, materials, operation, maintenance, inspections, etc). Clearly the San Bruno disaster shows this is currently not the case.

For these reasons, we continue to oppose any change to the seven-year re-inspection interval for natural gas transmission pipelines.

Requiring automated shut off valves for gas and liquid transmission pipelines

Sixteen years ago Congress was debating a requirement for remote or automatic shutoff valves on natural gas pipelines in the wake of the Edison, NJ accident and the two and a half hours it took to shut off the flow of gas that fed the fireball due to the lack of a remotely controlled shut off valve. It is both puzzling and sad that we have to again debate the benefits of requiring remote or automatic shut off valves after another tragedy, this time in San Bruno, California.

It is unacceptable that the only way to shut off a large pipeline spewing fire into a populated neighborhood is to find someone with a key to a locked valve, have him or her drive to the valve and operate it manually. In good weather in San Bruno that method took an hour and a half to shut off the flow of fuel. How long would that method take after an earthquake? We ask that you direct the Secretary of Transportation to immediately begin a study to determine the type, placement, feasibility and phase in period for installation of more up-to-date valves, and that a rule-making for such installation is accomplished by December 31, 2012.

For liquid pipelines in 1992, 1996, 2002, and 2006, Congress required OPS to "survey and assess the effectiveness of emergency flow restricting devices...to detect and locate hazardous liquid

pipeline ruptures and minimize product releases”² with the first such requirement having a deadline in 1994 (17 years ago!). Following this analysis, Congress required OPS to “prescribe regulations on the circumstances under which an operator of a hazardous liquid pipeline facility must use an emergency flow restricting device.”³

OPS/PHMSA never issued a formal analysis on emergency flow restricting device (EFRD) effectiveness. Instead, in its hazardous liquid pipeline integrity management rule⁴, OPS rejected the comments of the NTSB, the US Environmental Protection Agency, the Lower Colorado River Authority, the City of Austin, and the Environmental Defense Fund and chose to leave EFRD decisions up to pipeline operators after listing in the rule various criteria for operators to consider. Such an approach to EFRD use does not appear to meet Congressional intent, partly because the approach is essentially unenforceable and not protective of important environmental assets such as rivers and lakes including those not considered High Consequence Areas.

Congress needs to reiterate its previous mandates to PHMSA on EFRD use on liquid pipelines and ensure they are followed to mitigate the extent of future pipeline releases.

Developing and implementing enhanced standards and requirements for leak detection on hazardous liquid lines

In its hazardous liquid transmission pipeline integrity management rule, PHMSA requires that operators have a means to detect leaks, but there are no performance standards for such a system.⁵ This is in contrast to the State of Alaska, for example, which requires that *all* crude oil transmission pipelines have a leak detection system capable of promptly detecting a leak of no more than 1% of daily throughput.⁶ PHMSA listed in the integrity management rule various criteria for operators to consider when selecting such a device. Again, such an approach is virtually unenforceable and not protective of important environmental assets such as rivers and lakes including those not considered High Consequence Areas.

The recent Enbridge spill in Michigan and the Chevron pipeline release near Salt Lake City are examples of what can go wrong when a pipeline with a leak detection system has no

² See 49 USC 60102(j)(1).

³ See 49 USC 60102(j)(2).

⁴ See 49 CFR 195.452(i)(4).

⁵ See 49 CFR 195.452(i)(3).

⁶ See 18 AAC 75.055(a)(1).

performance standards for operations. In both those incidents the pipelines had leak detection systems as required by regulations, but neither system was capable of detecting and halting significant spills.

We ask that Congress direct PHMSA to issue performance standards for leak detection systems used by hazardous liquid pipeline operators by a date certain to prevent damage from future pipeline releases.

Regulating gas gathering pipelines

Significant drilling for natural gas has led to a large expansion of gathering and production pipelines in highly populated urban areas. For instance, in Fort Worth, Texas there are already 1,000 producing gas wells within the city limits and at least that many more planned.

Development of advanced shale gas drilling methods has led to thousands of new wells being drilled and proposed in more populated areas of Texas, Arkansas, Louisiana, Pennsylvania and New York. Pipelines will connect all these wells, and the regulatory oversight of these pipelines in these areas is less than clear and in some cases non-existent. According to a recent briefing paper from PHMSA⁷ they only regulate 20,150 miles of onshore gathering lines, but they estimate that there are 230,000 miles of such lines. Many of these lines are the same size and pressure as transmission pipelines, but they are regulated far less, if at all.

To make matters worse, the standard (API RP 80) for determining what is and isn't a gathering line was written by the American Petroleum Institute and adopted into federal regulations. What the API standard actually requires provides too much wiggle room for gas producers to design their systems to avoid regulations. PHMSA's recent briefing paper also recognizes this problem saying "enforcement of the current regulations has been hampered by the uncertainties that exist in applying API RP 80."⁸

We believe it is time to ensure that any gathering or production pipeline with similar size and pressure characteristics to transmission pipelines fall under the same level of minimum federal regulations, including the integrity management requirements for those in high consequence areas. At a minimum we think Congress should require PHMSA to produce a study on the

⁷ PHMSA Briefing Paper, Onshore Gas Gathering, Technical Pipeline Safety Standards Committee Meeting, March 2011

⁸ Ibid.

regulatory issues with onshore gas production and gathering pipelines, and institute a rule making based on the findings by a date certain.

Regulating unregulated liquid pipelines

Onshore oil wells and their associated pipelines have a troubling spill record and a highly inadequate oversight framework, which needs to be addressed by Congress and the Obama Administration. Recently, the Administration and BP agreed to a proposed civil settlement for 2006 pipeline spills on the North Slope of \$25 million plus a set of required safety measures on BP's federally unregulated North Slope pipelines.⁹ Under the requirements of the settlement, BP's federally-unregulated oil field pipelines, i.e., three-phase flowlines (gas, crude, produced water mixture), produced water lines, and well lines, now will be subject to integrity management requirements largely similar to those that must be met by transmission pipelines in 49 CFR 195. While this settlement certainly is a welcome step for BP's lines and an important precedent, Congress in its pipeline safety act reauthorization and PHMSA need to move forward expeditiously on requiring such measures for lines operated by other companies in Alaska and the Lower 48.

BP's March 2006 spill of over 200,000 gallons was the largest crude oil spill to occur in the North Slope oil fields and it brought national attention to the chronic problem of such spills. Another pipeline spill in August 2006 resulted in shutdown of BP's production in Prudhoe Bay and brought to light major concerns about systemic neglect of key infrastructure. Lack of adequate preventive maintenance was not a new issue, however, as corrosion problems in Prudhoe Bay's and other oil field pipelines have been raised previously by regulators and others, including as early as 1999 by the Alaska Department of Environmental Conservation.¹⁰

As additional evidence of the problems with upstream infrastructure, the State of Alaska completed a report¹¹ in November 2010, which reviewed a set of over 6,000 North Slope spills

⁹ Proposed settlement posted at <http://media.adn.com/smedia/2011/05/03/10/29-1%20consent%20decree.112830.source.prod.affiliate.7.pdf> (downloaded May 8, 2011).

¹⁰ Charter for the Development of the Alaskan North Slope, December 2, 1999, (BP ARCO Merger Agreement), <http://www.dec.state.ak.us/spar/ipp/docs/Charter%20Agreement.pdf>.

¹¹ *North Slope Spills Analysis: Final Report on North Slope Spills Analysis and Expert Panel Recommendations on Mitigation Measures*, Nuka Research & Planning Group, LLC for the Alaska Department of Environmental Conservation, November 2010, 244 pp., <http://www.dec.state.ak.us/spar/ipp/ara/documents/101123NSSAReportvSCREEN.pdf>.

from 1995-2009. This report showed that there were 44 loss-of-integrity spills/year¹² with 4.8 spills greater than 1,000 gallons/year.¹³ Of the 640 spills included in the report, a significant proportion, 39%, were from federally unregulated pipelines.¹⁴

We ask that Congress close the loopholes on these federally unregulated pipelines and direct PHMSA to move forward as fast as is practicable to put in place regulations similar to what was recently agreed to by BP on their unregulated North Slope pipelines.

Correcting the pipeline siting vs. safety disconnect, and ensuring PHMSA's ability to provide inspections when pipelines are being constructed

With thousands of new miles of pipelines in the works, the disconnect between the agencies that site new pipelines and PHMSA, the agency that is responsible for the safety of the pipelines once they are in service, has become quite apparent. While siting agencies go through supposedly comprehensive environmental review processes, these processes are functionally separate from the special permits or response plans or high consequence area analyses that are overseen by PHMSA. Many of the PHMSA determinations go through very limited public process (special permits), or processes that take place after the pipeline siting approval is granted (emergency response plans), and some are totally kept from the public (high consequence areas). How can local governments, citizens, or even other federal agencies assess the real potential impact of a pipeline if the environmental review and the safety review processes are so disconnected?

A perfect example of this disconnect is currently taking place regarding the Presidential Permit that the U.S. State Department is considering for the Keystone XL pipeline. For months now national organizations have been asking specific pipeline safety questions related to the corrosiveness and abrasiveness of the product the Keystone XL will transport, and just last week the U.S. EPA questioned the State Department's SDEIS because not enough information was included regarding the proposed products to allow for an analysis of the effects if a spill should occur. While the State Department is in charge of granting the permit to allow the pipeline to be sited, PHMSA is the agency in charge of both pipeline safety and spill planning for the pipeline, yet it has been silent on these issues. As Senator Johanns from Nebraska said during a pipeline safety hearing last year "Of all the expertise relative to pipelines in the federal government I

¹² *Ibid.*, p. 21.

¹³ *Ibid.*, p. 23.

¹⁴ Certain types of spills were not included. See p. 14 of the *North Slope Spills Analysis* report.

can't imagine it would be at the State Department."¹⁵ Unfortunately the State Department seems to be getting precious little help from the agency in charge of pipeline safety –PHMSA. This disconnect between siting and safety needs to be corrected.

Two years ago, PHMSA held a special workshop to go over the numerous problems they found during just 35 inspections of pipelines under construction. These inspections found significant problems with the pipe coating, the pipe itself, the welding, the excavation methods, the testing, etc. PHMSA's findings, and stories we have heard from people across the country, call into question the current system of inspections for the construction of new pipelines. This construction phase is critical for the ongoing safety of these pipelines for years to come. Since PHMSA has authority over the safety of pipelines once they are put into service, it makes sense to us that during construction they also are conducting field inspections and sufficiently reviewing records to ensure these pipelines are being constructed properly. Unfortunately, there is a built-in disincentive for PHMSA to spend the necessary time to ensure proper construction. Under current rules PHMSA receives no revenue from these companies until product begins to flow through the pipelines, so any staff time spent on these pre-operational inspections has to be paid for from money collected for other purposes from already operational pipelines.

For these reasons, the Pipeline Safety Trust asks that Congress pass new Cost Recovery fees, similar to those included in Section 17 of the PIPES act for LNG facility reviews, to allow PHMSA to recoup their costs related to providing safety information during the review process for all new pipelines and legitimate inspections during the construction phase without taking resources away from other existing activities. Hopefully this additional revenue will help PHMSA ensure that pipeline siting agencies adequately assess pipeline safety issues.

Continuing to push state agencies on damage prevention

Property owners, contractors, and utility companies digging in the vicinity of pipelines are still one of the major causes of pipeline incidents, and for distribution pipelines over the past five years excavation damage is the leading cause of deaths and injuries. Unfortunately, not all states have implemented needed changes to their utility damage prevention rules and programs to help counter this significant threat to pipelines.

¹⁵ U.S. Senate Commerce, Science & Transportation Committee Hearing, Ensuring The Safety Of Our Nations Pipelines, June 24, 2010, 44 minutes into the tape.

In the PIPES Act of 2006 Congress made clear its desire that states move forward with damage prevention programs by defining the nine elements that are required to have an effective state damage prevention program. The Trust is pleased that PHMSA has recently announced its intent to adopt rules to incorporate these nine elements, and its intent to evaluate the states progress in complying with them. We also support PHMSA's plan to exert its own authority to enforce damage prevention laws in states that won't adopt effective damage prevention laws. We hope Congress will encourage PHMSA to move forward with this proposed rulemaking in a timely manner, and make it clear to the states that federal money for pipeline safety programs depends upon significant progress in implementing better damage prevention programs.

It may also be necessary for Congress to clarify important parts of good damage prevention programs. Many states have exemptions to their damage prevention "one call" rules for a variety of stakeholders including municipalities, state transportation departments, railroads, farmers, and property owners. We believe such exemptions, except in cases of emergencies, are unwarranted for municipalities, state transportations departments and the railroads, and urge both Congress and PHMSA to make it clear that these types of exemptions are not acceptable in an effective damage prevention program. While we are skeptical regarding exemptions of any type, limited exemptions for the farm community and homeowners in specific circumstances may be necessary to make the programs efficient, affordable and enforceable.

Although PHMSA likes to call itself a data-driven agency, there is a serious lack of data to determine the extent, causes, or perpetrators of excavation damage to pipelines. For example, because of the limited reporting requirements, the PHMSA incident database only includes about 70 total pipeline incidents nationwide in 2008 caused by excavation damage. Yet the Common Ground Alliance's 2008 DIRT database reports well over 60,000 excavation events that affected the operation of natural gas systems alone.

For these reasons, the Trust asks that Congress direct PHMSA to correct this substantial data gap by ensuring more accurate reporting and a database for excavation damage to ensure that the effort and money being spent is well targeted and effective. Because most states have taken on the responsibility of operating state-based damage prevention programs it may well be easiest to just have PHMSA require states to adopt reporting requirements as part of their damage prevention programs.

Implementing the Pipelines and Informed Planning Alliance (PIPA) recommendations

Section 11 of the Pipeline Safety Improvement Act of 2002 included a requirement that PHMSA and FERC provide a study of population encroachment on and near pipeline rights-of-way. That requirement led to the Transportation Research Board's (TRB) October 2004 report Transmission Pipelines and Land Use, which recommended that PHMSA "develop risk-informed land use guidance for application by stakeholders." PHMSA formed the Pipelines and Informed Planning Alliance (PIPA) in late 2007 with the intent of drafting a report that would include specific recommended practices that local governments, land developers, and others could use to increase safety when development was to occur near transmission pipelines.

Most large pipelines were placed in rural areas years ago, but as the populated areas around our cities expand it has led to a growing encroachment of residential and commercial development near large high-pressure pipelines. This increases the risk to the pipelines from related construction activities, as well as to the people who ultimately live and work nearby if something should go wrong with the pipeline.

After more than two years of work by more than 150 representatives of a wide range of stakeholders, the PIPA report and the associated 46 recommendations were released late last year. This is the first time information of this nature has been made widely available to local planners, planning commissions, and elected officials when considering the approval of land uses near transmission pipelines. We fully agree with the sentiment of Congress in the Pipeline Safety Improvement Act of 2002 that,

"The Secretary shall encourage Federal agencies and State and local governments to adopt and implement appropriate practices, laws, and ordinances, as identified in the report, to address the risks and hazards associated with encroachment upon pipeline rights-of-way..."

A recent statewide survey of local government planning directors conducted by the Pipeline Safety Trust¹⁶ showed that to successfully implement these needed "practices, laws, and ordinances" it will take a good deal of well targeted education and promotion by a wide range of stakeholders outside of the pipeline industry and PHMSA. In order to make this effort successful, the Trust asks that this year Congress authorize, just as was authorized in PIPES for the successful promotion of the 811 "One Call" number, \$500,000/year to promote, disseminate, and provide technical assistance regarding the PIPA recommendations.

¹⁶ <http://www.pstrust.org/TagGrant1.htm>

Continuing the implementation and funding of Technical Assistance Grants to Communities

Over the past two and a half years, PHMSA has started the implementation of the Community Technical Assistance Grant program that was authorized as part of the Pipeline Safety Improvement Act of 2002 and clarified in the PIPES Act. Under this program more than a million dollars of grant money has been awarded to communities across the country that wanted to hire independent technical advisors so they could learn more about the pipelines running through and surrounding them, or be valid participants in various pipeline safety processes.

In the first two round of grants, PHMSA funded 46 projects in 22 states from California to Florida. Local governments gained assistance so they could better consider risks when residential and commercial developments are planned near existing pipelines. Neighborhood associations gained the ability to hire experts so they could better understand the “real” versus the imagined issues with pipelines in their neighborhoods. And farm groups learned first-hand about the impacts of already-built pipelines on other farming communities so they could be better informed as they participate in the processes involving the proposed routing of a pipeline through the lands where they have lived and labored for generations. Overall, we viewed the implementation of this new grant program as a huge success.

Ongoing funding for these grants is not clear, so the Trust asks that you ensure the reauthorization of these grants to continue to help involve those most at risk if something goes wrong with a pipeline. We further ask that you do whatever is necessary to ensure that the authorized funds are actually appropriated.

Continuing to make more pipeline safety information publicly available

Over the past two reauthorization cycles, PHMSA has done a good job of providing increased transparency for many aspects of pipeline safety. In the Trust’s opinion, one of the true successes of PIPES has been the rapid implementation by PHMSA of the enforcement transparency section of the act. It is now possible for affected communities to log onto the PHMSA website and review specific enforcement and inspection actions regarding local transmission pipelines. This transparency for the most part should increase the public’s trust that our system of enforcement and inspection of pipelines is working adequately or in some instances may provide the information necessary for the public to push for improvements from specific companies.

PHMSA has also significantly upgraded their incident data availability and accuracy, and continues to improve their already excellent “stakeholder communication” website.

There is also a need to make other information more readily available. This includes information about:

- **High Consequence Areas (HCAs).** These are defined in federal regulations and are used to determine which pipelines fall under more stringent integrity management safety regulations. Unfortunately, this information is not made available to local government and citizens so they know if they are included in such improved safety regimes. Local government and citizens also would have a much better day-to-day grasp of their local areas and be able to point out inaccuracies or changes in HCA designations if this information were publicly available.

- **Emergency Spill Response Plans.** As has been learned in the Gulf of Mexico tragedy, it is crucial that these types of spill response plans are well designed, adequately meet worst-case scenarios, and use the most up-to-date technologies. While 49 CFR §194 requires onshore oil pipeline operators to prepare spill response plans, including worst case scenarios, those plans are difficult for the public to access. To our knowledge the plans are not public documents, and they certainly are not easily available documents.

The review and adoption of such response plans is also a process that does not include the public. In fact PHMSA has argued that they are not required to follow any public processes, such as NEPA, for the review of these plans. If the Gulf tragedy has taught us nothing else it should have taught us that the industry and agencies could use all the help they can get to ensure such response plans will work in the case of a real emergency.

It is always our belief that greater transparency in all aspects of pipeline safety will lead to increased involvement, review and ultimately safety. There are many organizations, local and state government agencies, and academic institutions that have expertise and an interest in preventing the release of fuels to the environment. Greater transparency would help involve these entities and provide ideas from outside of the industry. The State of Washington has passed rules¹⁷ that when complete spill plans are submitted for approval the plans are

¹⁷ See Washington Administrative Code 173-182-630

required to be made publicly available, interested parties are notified, and there is a 30 day period for interested parties to comment on the contents of the proposed plan. We urge Congress to require PHMSA to develop similar requirements for the adoption of spill response plans across the country, and that such plans for new pipelines be integrated into the environmental reviews required as part of the pipeline siting process.

• **State Agency Partners.** States are provided with millions of dollars of operating funds each year by the federal government to help in the oversight of our nation's pipelines. While there is no doubt that such involvement from the states increases pipeline safety, different states have different authority, and states put different emphasis in different program areas. After the San Bruno tragedy an independent review panel was formed to review problems with the pipeline safety system in California. One of their recent conclusions regarding the California Public Utility Commission was that *"it would be difficult for the gas safety staff to offer assurances on the quality of prevailing integrity management efforts they audit."*¹⁸ Why was it that such stunning conclusions about one of the largest pipeline safety programs in the nation were not understood before eight people were killed? Each year PHMSA audits each participating state program, yet the results of those program audits are not easily available. We believe that these yearly audits should be available on PHMSA's website and that some basic comparable metrics for states should be developed. It is not only the performance of pipeline companies that needs to be inspected.

Making public awareness programs meaningful and measurable

The Pipeline Safety Improvement Act of 2002 required pipeline operators to provide people living and working near pipelines, emergency responders, and local public officials basic pipeline safety information, and gave PHMSA the authority to set public awareness program standards and design program materials. This public awareness effort represented a huge and important undertaking for the pipeline industry, and as such the effectiveness of it will evolve over time. We were happy that the rules included a clause that set evaluation requirements that require verifiable continuous improvements.

¹⁸ http://www.cpuc.ca.gov/PUC/events/110609_sbpanel.htm - Page 22 of the Executive Summary

Unfortunately, recent incidents such as the San Bruno, California tragedy and the huge oil spill into the Kalamazoo River in Michigan have shown that to date these awareness programs seem to be generally ineffective. In fact, after nearly every major incident in recent history news stories emerge of residents, and often firefighters, stating they had no idea such pipelines existed in their communities. In 2009 the National Transportation Safety Board cited the failure of these programs in the investigation report¹⁹ of a deadly pipeline explosion in Carmichael, Mississippi that killed a girl and her grandmother. NTSB has also focused on the adequacy of these programs as part of their investigation of the San Bruno tragedy.

While the evidence indicates that there is still much more to do to ensure that the millions of dollars of consumer money being spent on these programs is not wasted, there are some indications that the industry wants to move in the wrong direction. API's recent update of the public awareness standard (API RP 1162) removes measuring actual behavior change in the targeted audiences as a measure of effectiveness. If the industry does not believe this outreach should change people's behavior such as - increasing the number of people that call 811 before they dig, or the number of firefighters that sign up for training on responding to pipeline incidents – then the industry is clearly missing the point.

We hope that Congress will keep a close eye on the discussions of this issue over the coming months and be prepared to step in and clarify that the intent of this program is to change the behavior of the intended audiences to make pipelines safer, not to count how many innocuous brochures can be mailed.

Implementing expansion of Excess Flow Valve requirements

One of the Trust's priorities that was well addressed in the PIPES Act was to require the use of Excess Flow Valves (EFVs) on distribution pipelines for most new and replaced service lines in single family residential housing. While this was a huge step forward, the National Transportation Safety Board (NTSB) has continued to push for an expansion of the use of EVFs in multi-family and commercial applications **“when the operating conditions are compatible with readily available valves.”**²⁰

¹⁹ NTSB Report Number: PAR-09-01

²⁰ NTSB Recommendation to PHMSA – #P-01-002

From closely following the deliberations of PHMSA's Large Excess Flow Valve Team, it is our opinion that there are thousands of potentially compatible structures being constructed or renewed which could be afforded greater safety by the installation of Excess Flow Valves (EFVs). It is clear from the data provided by PHMSA that the service lines serving a majority of these types of structure fall within the size constraints of commercially available EFVs. It is also clear from the data that the vast majority of these gas services are provided at pressures that avoid the concerns regarding low pressure lines.

There are many multi-family residential, small office, and retail structures that for all intents and purposes have the same load profiles as a single family residence. For these types of applications PHMSA and the industry need to move forward with rules to require installation of EFVs for new and renewed gas service.

For these reasons the Pipeline Safety Trust urges Congress to direct PHMSA to undertake a rulemaking—as the National Transportation Safety Board has requested—that would require EFVs be installed on the many types of structures where “**operating conditions are compatible with readily available valves.**”

Concerns with industry developed standards being incorporated into federal regulations

There has been increasing attention because of the Gulf of Mexico tragedy to the practice by federal agencies of incorporating into their regulations standards that outside organizations developed. Like MMS and many others, PHMSA has incorporated by reference into its regulations standards developed by organizations made up in whole or in part of industry representatives. A review of the Code of Federal Regulations under which PHMSA operates finds the following numbers of incorporated standards:

**Standards Incorporated by Reference in 49 CFR Parts 192, 193, 195
(As of 6/9/2010)**

CFR Part	Topic	Standards*
192	Natural and Other Gas	39
193	Liquefied Natural Gas	8
195	Hazardous Liquids	38

Total 85

*Note: Some standards may be incorporated by reference in more than one CFR Part.

Those standards were developed by the following organizations:

- American Gas Association (AGA)
- American Petroleum Institute (API)
- American Society for Testing and Materials (ASTM)
- American Society of Civil Engineers (ASCE)
- ASME International (ASME)
- Gas Technology Institute (GTI)
- Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS)
- NACE International (NACE)
- National Fire Protection Association (NFPA)
- Pipeline Research Council International, Inc. (PRCI)
- Plastics Pipe Institute, Inc. (PPI)

While the Pipeline Safety Trust has not done an extensive review of these organizations or their standard setting practices, it is of great concern to us—and we believe it should be to Congress as well—whenever an organization whose mission is to represent the regulated industry is—in essence—writing regulations that members of the organization must follow. A very quick review of the mission statements of some of these organizations reveals statements like these below that show, at a minimum, a conflict between the best possible regulations for the entire public and the economic interests of the industry.

API – “We speak for the oil and natural gas industry to the public, Congress and the Executive Branch, state governments and the media. We negotiate with regulatory agencies, represent the industry in legal proceedings, participate in coalitions and work in partnership with other associations to achieve our members’ public policy goals.”

AGA – “Focuses on the advocacy of natural gas issues that are priorities for the membership and that are achievable in a cost-effective way.” “Delivers measurable value to AGA members.”

PPI – “PPI members share a common interest in broadening awareness and creating opportunities that expand market share and extend the use of plastics pipe in all its many applications.” “the mission of The Plastics Pipe Institute is to make plastics the material of choice for all piping applications.”

The pipeline industry has considerable knowledge and expertise that needs to be tapped to draft standards that are technically correct and that can be implemented efficiently. But we also know the industry’s standard setting practices exclude experts and stakeholders who can bring a broader “public good” view to standard setting. We also know that when a regulatory agency needs to adopt industry-developed standards it is a “red flag” that the agency lacks the resources and expertise to develop these standards on its own.

Even once the standards are incorporated by reference into federal regulations the standards remain the property of the standard setting organization and are not provided by PHMSA in their published regulations. If the public, state regulators, or academic institutions want to review the standards they have to purchase a copy from the organization that drafted them. In many cases, this further removes review of the standards from those outside of the industry. The American Petroleum Institute has recently implemented a system that allows the public to freely view their incorporated standards online.²¹ We applaud this move and hope other standard setting organizations follow the API lead. Below are just a handful of examples of the cost to purchase for review the standards that are part of the federal pipeline regulations:

Sample Cost of Pipeline Safety Standards Incorporated by Reference Into Federal Regulations (As of 6/8/2010)

Standard	Organization	Code of Federal Regulations (Incorporated by Reference)	Cost
ASME B31.4 -2002 "Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids"	ASME	49 CFR §195.452	\$129.00
GRI 02/0057 (2002) "Internal Corrosion Direct Assessment of Gas Transmission Pipelines Methodology"	GTI	49 CFR §192.927	\$295.00
NACE Standard RP0502-2002 "Pipeline External Corrosion Direct Assessment Methodology"	NACE	49 CFR §192.923, §192.925, §192.931, §192.935, §192.939, §195.588	\$83.00
A Modified Criterion for Evaluating the Remaining Strength of Corroded Pipe,"	PRCI	49 CFR §192.933, §192.485, §195.452	\$995.00

The Pipeline Safety Trust asks that Congress carefully review the use of industry developed standards in minimum federal pipeline safety regulations, and direct these important parts of federal regulations to be made easily available to the public.

²¹ <http://publications.api.org/>

Other pending pipeline safety improvements that we support

Senate Bill 275 recently unanimously passed out of committee in the Senate, and it contains many good clauses that we have not discussed here today. We support the following additional sections from that legislation.

- Increasing fines for pipeline safety violations
- Increasing personnel for PHMSA
- Maximum allowable operating pressure verification and overpressure reporting
- Review of current regulations to determine adequacy for transporting Tar Sands crude oil

The Administration has also proposed some changes to the statute. We support the following parts of that proposal that we have not already discussed today.

- Cost recovery fees for the review of special permit applications

Thank you again for this opportunity to testify today. The Pipeline Safety Trust hopes that you will closely consider the concerns we have raised and the requests we have made. If you have any questions now or at anytime in the future, the Trust would be pleased to answer them.

Mr. WHITFIELD. Thank you. Mr. Helms, you are recognized for 5 minutes.

STATEMENT OF CHRISTOPHER A. HELMS

Mr. HELMS. Thank you, Chairman Whitfield, Ranking Member Rush, and members of the committee.

My name is Chris Helms. I am CEO of NiSource Gas Transmission and Storage and chairman of the INGAA Board Taskforce on Pipeline Safety. NiSource operates more than 15,000 miles of natural gas transmission pipelines extending from the Gulf Coast to the Northeast.

Today, I am testifying on behalf of INGAA, the Interstate Natural Gas Association of America. INGAA represents the Nation's interstate natural gas transmission pipeline industry, and as seen on Slide #1, our members operate a 200,000-mile network of large-diameter pipelines that transport natural gas throughout the Nation.

[Slide shown.]

I would like to state at the outset that while the safety record of the natural gas transmission system is very strong, we recognize that continuous improvement is imperative. We want to work with you and other stakeholders to achieve our primary goal of zero pipeline incidents. Demand for natural gas is growing, and as a result, maintaining the public trust in pipeline safety is critical.

[Slide shown.]

Slide 2 shows the interstate natural gas transmission pipelines that have been approved for construction by the FDRC over the past decade. Due to the growing demand for domestic shale gas, gas pipeline infrastructure has expanded significantly and will likely continue to grow. Ensuring the safe and reliable operation of these systems will remain critical and is the highest priority for this industry.

As part of the Pipeline Safety Improvement Act of 2002, natural gas transmission pipeline operators were required to implement an integrity management program. Integrity management is a strategic risk-based approach that focuses on identifying and mitigating risk in populated areas. The program requires continual pipeline assessments and the repair and remediation of any potential safety problems that are found.

The vast majority of baseline assessments under the program are nearing completion. Consistent with the schedule established by Congress, while only 4.5 percent of INGAA member pipeline members are located in populated areas covered under the program, baseline assessments have been completed on more than 50 percent of the pipeline miles to date.

With the first round of assessments almost complete, we believe now is an ideal time to reflect upon the effectiveness of this program. Last year, the INGAA Board established a senior-level task force and then adopted clear guiding principles to define and lead our industry to improve safety performance. Our 5-point principles are outlined in Slide 3 as follows:

Our goal is zero incidents, a perfect record of safety and reliability for the national pipeline system. We will continue to work every day towards this goal. We are committed to safety culture as

a critical dimension to continuously improving our industry's performance. Third, we will be relentless in our pursuit of improving by learning from the past and anticipating the future. Fourth, we are committed to applying integrity-management principles on a system-wide basis, as Mr. Weimer said. And last, we will engage our stakeholders from the local community to the national level so they can understand and participate in reducing risk.

To translate these principles into action, the taskforce has commissioned an initiative we call "Integrity Management Continuous Improvement." Our objective is to assess our performance, identify lessons learned, and target areas in need of improvement. Action plans have been developed and teams are already working in key areas to move us towards achieving our goal of zero incidents.

In light of recent pipeline incidents, it is important to reassess our infrastructure and better characterize the conditions that contribute to pipeline failures. A pipeline fails when its conditions deteriorate or service environment changes to a point where the pipeline is no longer fit for service. To achieve zero incidents, our focus must remain on that standard. Any pipeline not fit for service, regardless of age, should be repaired, replaced, or retired. Older pipelines can remain fit for service if operating conditions are controlled and the pipeline is properly maintained. On the other hand, even the newest pipelines can be susceptible to failure due to threats like excavation damage or outside forces. Age is an important consideration but is only one indicator of a pipeline's fitness for service.

Pipeline safety is a shared responsibility which requires close cooperation among all stakeholders. We are actively engaged in critical call-before-you-dig programs, and as you can see this morning, I am wearing the 8-1-1 call-before-you-dig pin. We work with local governments to educate them about development around existing pipelines. We are working with first responders to train emergency personnel on how to prevent and respond to natural gas pipeline emergencies. Our efforts to engage our stakeholders are numerous and this interaction is critical to achieving our goal of zero incidents.

In drafting a reauthorization bill, INGAA believes that legislation recently approved by the Senate Commerce Committee provides a good framework to follow.

I see that my time is about up, so Mr. Chairman, what I would like to say in closing is we hope that Congress will complete reauthorization of a bill this year and view the progress being made in that regard as encouraging. Thank you for the opportunity to testify today and I look forward to your questions.

[The prepared statement of Mr. Helms follows:]

**TESTIMONY OF
CHRISTOPHER A. HELMS
EXECUTIVE VICE PRESIDENT AND GROUP CEO
NISOURCE GAS TRANSMISSION & STORAGE**

**ON BEHALF OF THE
INTERSTATE NATURAL GAS ASSOCIATION OF AMERICA**

**BEFORE THE
SUBCOMMITTEE ON ENERGY AND POWER
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES**

**HEARING REGARDING
THE AMERICAN ENERGY INITIATIVE: PIPELINE SAFETY**

JUNE 16, 2011

Interstate Natural Gas Association of America
20 F Street, NW, Suite 450
Washington, DC 20001
202-216-5900
www.ingaa.org

Mr. Chairman and Members of the Subcommittee:

Good morning. My name is Chris Helms, and I am CEO of NiSource Gas Transmission & Storage, and chairman of the INGAA board's task force on pipeline safety. NiSource Gas Transmission & Storage owns and operates more than 15,000 miles of natural gas pipelines that are integrated with one of the largest underground storage systems in North America. From the Gulf Coast to the Midwest, Mid-Atlantic and Northeast, our systems connect natural gas supplies with energy markets in more than 16 states. Approximately 1.3 trillion cubic feet of natural gas flows through our pipeline and storage systems each year.

Today I am testifying on behalf of the Interstate Natural Gas Association of America, or INGAA. Our members operate approximately two-thirds of the nation's natural gas transmission pipelines and 90 percent of the interstate natural gas transmission pipelines in the United States. The pipeline systems operated by INGAA's member companies are analogous to the interstate highway system, transporting natural gas across state and regional boundaries. I want to state at the outset that, while the safety record of the natural gas transmission sector is very strong, we at INGAA recognize that continuous improvement in the safety of our pipelines is an imperative, and we want to work with each of our stakeholders to achieve our primary goal of zero pipeline accidents.

INDUSTRY BACKGROUND

To provide context for addressing specific pipeline safety issues, I first want to provide the subcommittee with some background on the natural gas transmission pipeline industry. There are approximately 300,000 miles of natural gas transmission pipelines¹ in the U.S., delivering one quarter of the nation's energy. Natural gas pipelines transport critical energy needed to heat our homes, cook our food, heat our water, and increasingly, power our electric grid. INGAA represents the interstate portion of the natural gas transmission system, or about 200,000 miles of pipeline (see Figure 1). These interstate systems are regulated at the federal level – by the Federal Energy Regulatory Commission (FERC) for construction approval and economic matters and by the Pipeline and Hazardous Materials Safety Administration (PHMSA) for safety matters. The remaining 100,000 miles are owned by intrastate transmission operators in natural gas-producing states such as Texas and Oklahoma, and by local gas distribution companies throughout America. These intrastate systems are regulated at the state level.

Our nation is currently witnessing significant growth in domestic, onshore natural gas supply thanks to technological improvements that have allowed producers to extract shale gas safely and economically. We also are seeing growth in demand for this clean-burning, abundant and domestic energy resource. As domestic natural gas supplies have grown in recent years, so too has the need for additional pipeline capacity to access and transport these supplies. This means that we are continuing to expand our natural gas

¹ Transmission pipelines can be defined as those which generally have a linear configuration, may be quite large in diameter, operate at high pressures, and traverse long distances.

pipeline infrastructure at an impressive pace, as evidenced by Figure 2. The expansion of the natural gas pipeline network, and the effective maintenance of new and existing systems, will be critical to the success of natural gas in meeting a larger share of America's growing energy needs.

Over time, the safety performance of our pipelines has improved steadily. From the inception of engineering standards in the 1920s, through the passage of the Natural Gas Pipeline Safety Act of 1968 and the adoption of federal regulations in 1970, continuously evolving laws, regulations and standards have ensured that pipelines are engineered, built, operated and maintained to high standards. Our improvement over the years is attributable to a concerted and sustained effort on the part of the industry, its regulators and other key stakeholders. Our safety record, however, is not perfect, and as we have seen recently, even infrequent pipeline accidents can have tragic consequences. One accident is one too many. We recognize that our industry can and must continue to improve.

INTEGRITY MANAGEMENT CONTINUOUS IMPROVEMENT

As part of the Pipeline Safety Improvement Act of 2002, each natural gas transmission pipeline operator is required to implement a formal Integrity Management Program, or IMP. This program standardized and regulated safety programs and best practices that were in many cases already in existence or under development at the time. IMP is a risk-based approach that focuses on identifying and mitigating risks in populated areas

surrounding pipelines. These populated areas are referred to as High Consequence Areas, or HCAs. The program requires a baseline assessment (or inspection) of all pipelines located in HCAs, and requires the repair and remediation of any potential safety problems found as a result of these assessments. The program also requires ongoing reassessments of pipelines located in HCAs. Since the IMP has created a database of information about the condition of our pipelines, it provides an excellent foundation for growing, expanding and improving our country's pipeline safety programs.

As part of the IMP, a baseline assessment of each pipeline located in an HCA must be completed by December 2012, just 18 months from now. The vast majority of these baseline assessments are already complete. While only 4.5 percent of INGAA member pipeline miles are classified as HCAs, baseline assessments have been performed along more than 50 percent of INGAA member pipeline miles to date. We expect that number to continue to grow.

Given that the "first round" of assessments is almost complete, and that reassessments are underway, now is an ideal time to reflect upon the effectiveness of the Integrity Management Program. Also, in light of the tragic pipeline accidents that occurred last year, INGAA's leadership recognized the need to take a fresh look at current pipeline safety programs. The INGAA board of directors formed a senior-level pipeline safety task force in late 2010. This task force drafted the following five guiding principles, which were formally adopted by the board of directors in March (Figure 3):

- 1) Our goal is zero incidents -- a perfect record of safety and reliability for the national pipeline system. We will continue to work every day towards this goal.
- 2) We are committed to a safety culture as a critical dimension to continuously improving our industry's performance.
- 3) We will be relentless in our pursuit of improving by learning from the past and anticipating the future.
- 4) We are committed to applying integrity management principles on a system-wide basis.
- 5) We will engage our stakeholders – from the local community to the national level – so they understand and can participate in reducing risk.

To translate these guiding principles into concrete actions, the task force has commissioned an initiative that we are calling Integrity Management Continuous Improvement. The goal of this initiative is to assess our performance, identify lessons learned and target areas in need of improvement. The risks that natural gas transmission pipelines face are complex, and no single, one-size-fits solution exists. Moving to a zero incident environment will require a comprehensive approach that tailors specific solutions for each pipeline.

PIPELINE “FITNESS FOR SERVICE”

Much of the recent public discourse on pipeline safety has focused on the age of the pipeline infrastructure. The conclusion seems to be that “old pipelines” are the problem,

and that the solution is replacing old pipelines with new ones. The facts, though, are not so simple.

Age, in and of itself, should not be the focus of our safety efforts. The focus should be on the *fitness for service* of a pipeline. Any pipeline – regardless of age – that is not fit for service should be repaired, replaced or retired. The key to achieving real, sustainable improvement in pipeline safety is to identify and address issues that impact fitness for service.

That is not to say we can ignore the age of a pipeline – age is an issue. But it is not the only issue, and it should not be a controlling issue. Just like homes in older neighborhoods, proper maintenance and timely upgrades can make a decades-old pipeline perfectly fit for service. An older pipeline can remain fit for service if its operating conditions are controlled and the pipe condition is properly monitored and maintained. On the other hand, even the newest and most advanced pipelines can be susceptible to failure due to threats such as excavation damage or weather and outside forces.

Thankfully, our ability to prevent and detect problems, and, if necessary, to repair and replace unfit pipe, has improved with the implementation of integrity management, pipeline testing and advances in technologies.

WORKING WITH STAKEHOLDERS

Another important element of INGAA's Guiding Principles is our proactive engagement with stakeholders. Pipeline safety is a shared responsibility. Whether it is first responders, excavators, or the general public, an awareness of pipeline infrastructure and involvement in important programs like "Call 811 Before You Dig" is critical to achieving our shared goal of zero pipeline incidents.

Clearly, accident prevention is "job one," but when a pipeline accident does occur, we must ensure that our partners in emergency response are armed with knowledge they need to respond and protect the public. As part of our emergency response planning, pipeline operators are required to establish and maintain open lines of communication with local fire, police, and related public officials.

At NiSource Gas Transmission & Storage, for example, we recently launched the Columbia Gas Fire School – a first-of-its-kind effort in partnership with Columbia Gas of Pennsylvania to provide first responders across our Pennsylvania and Maryland operating areas with specialized classroom and hands-on training to respond to a natural gas emergency. We recently celebrated the completion of the inaugural Fire School class with more than 50 firefighters representing communities across Western Pennsylvania.

COMMENTS ON SENATE LEGISLATION

As this testimony is being prepared, the only pipeline safety reauthorization bill introduced in this Congress is the Pipeline Transportation Safety Improvement Act of 2011 (S. 275). That legislation was unanimously reported out of the Senate Commerce, Science and Transportation Committee in May. As this Subcommittee looks at drafting its own bill in the coming weeks, we would like to inform your efforts by commenting on specific provisions in the Senate bill.

In general, S. 275 is a good bill. INGAA is urging the full Senate to pass this bill as it was reported by the committee. The bill sets strong aspirational goals for PHMSA and for the pipeline industry, while directing the regulator to develop specific technical standards or requirements. This strikes us as the right balance, and we encourage the same type of approach in the House legislation. Our comments below note both provisions of S. 275 that are particularly constructive as well as other areas in which we suggest relatively minor additions or modifications:

Damage Prevention

The Senate bill continues the decade-long effort to improve state damage prevention laws by setting strong minimum standards and prohibiting exemptions for municipalities, state agencies (such as highway departments) and their contractors. Accidental damage to pipelines by excavators remains a leading cause of deaths and injuries along pipeline systems. Excavation incidents are the most avoidable of pipeline accidents, and the best

method for prevention is through the implementation of comprehensive damage prevention programs. Requiring all excavators to “call before digging” is critical to a successful damage prevention program, and therefore exemptions from participation, especially for large-volume excavators, make little sense. INGAA supports the Senate bill provision.

Automatic and Remotely Controlled Shut off Valves

INGAA believes that this provision is balanced and well written, and therefore supports this provision. We recommend striking existing section 60102(j)(3) of title 49 because it would be superseded by this new provision.

Integrity Management

INGAA generally supports the update of the natural gas transmission Integrity Management Program envisioned in S.275. We suggest that a House bill include the following refinements:

- 1) **Class location requirements** – The pipeline safety regulations for natural gas transmission lines promulgated in 1970 included “class location” requirements intended to ensure that pipeline operators employ an increased margin of safety for pipeline segments located in populated areas. Pursuant to these regulations, pipelines must undertake periodic surveys to identify population increases in close proximity to the pipeline right-of-way. Where applicable, the regulations required that this increased margin of safety be achieved by:

(1) installing replacement pipe with a higher strength relative to operating pressure, (2) reducing the operating pressure of the system, or (3) undertaking periodic hydrostatic testing. In practice, the primary method of complying with this requirement has been through pipe replacement.

When proposed a decade ago, it was assumed that IMP largely would supplant class location requirements, since both programs are designed to reduce risk in populated areas and IMP is a far more sophisticated, data-driven alternative. In fact, when DOT developed its cost-benefit analysis for the integrity management rule in 2003, the agency assumed that the industry would save \$1 billion over 10 years because class location requirements would be waived for pipe segments covered by IMP.² While PHMSA has granted a number of such waivers, a uniform requirement that avoids redundancy would be a more efficient and cost-effective solution.

Section 7(a)(2) of S. 275 suggests that the Secretary evaluate whether the expansion of integrity management “would mitigate the need for class location requirements...” We hope Congress will specifically direct the Secretary to eliminate the duplicative class location requirements for pipeline segments covered by the Integrity Management Program. In addition, INGAA recommends that it be clarified that this section applies only to natural gas transmission facilities.

² RSPA Final Regulatory Evaluation, Pipeline Integrity Management in High Consequence Areas, Docket RSPA-00-7666-356.

- 2) **Reassessment intervals** – Congress in 2002 mandated a seven-year reassessment interval for all natural gas transmission pipelines, regardless of risk or engineering analysis to the contrary. Congress also charged the Government Accountability Office (GAO) with analyzing this issue and making a recommendation. GAO delivered its recommendation in 2006, stating that the seven-year mandate “appears to be conservative,” and that “Congress should consider amending section 14 of the Pipeline Safety Improvement Act of 2002 to permit pipeline operators to reassess their gas transmission pipeline segments at intervals based on technical data, risk factors, and engineering analysis.”³

INGAA still believes that it would be the best policy for IMP reassessment intervals to be established by regulation, based upon technical analysis, rather than to be specifically prescribed by statute. Since IMP baseline assessments will be complete next year, and reassessments are already underway, perhaps GAO should be directed to update its recommendation to incorporate this experience (for example, by comparing the number of pipeline anomalies found during baseline assessments with anomalies found during reassessments). This would provide an additional measure of confidence should the Congress later choose to amend the statute to authorize a rulemaking on a risk-based approach.

³ GAO-06-945, Natural Gas Pipeline Safety: Risk-Based Standards Should Allow Operators to Better Tailor Reassessments to Pipeline Threats, September 2006.

- 3) **Seismicity** – The Senate bill was amended during markup to require the Secretary to “consider the seismicity” of an HCA when “identifying” such areas. This language as drafted creates some confusion. It is the pipeline operators, not the Secretary, who identify HCAs, based on the criteria established by PHMSA and subject to review by PHMSA. Should the House elect to address seismicity, INGAA recommends a clarification that would require pipeline operators consider seismic activity as part of their continuing IMP analysis.

Incident Notification

INGAA supports the Senate provision on this issue, but notes that a statutory requirement to notify all state and local government officials within a short time frame could be present significant compliance problems. The National Response Center was created to coordinate notification of an incident and remains the best way to achieve timely notification.

Cost Recovery for Design Reviews

PHMSA now is funded, almost exclusively, through user fees assessed on regulated liquid pipelines, LNG terminal owners, and natural gas transmission pipelines. The proceeds of this user fee fund the operations and staff of PHMSA, as well as the state grants that PHMSA provides annually.

PHMSA contends that a special user fee should be created to recover costs incurred when it reviews proposed new, large pipeline construction projects. PHMSA has indicated that this authority would be used only for exceptionally large projects that require significant PHMSA staff resources. The Senate bill creates a threshold for paying this new user fee that would apply to projects with a total cost of \$3.4 billion or greater, or projects that use “new or novel technologies or designs.”

INGAA generally supports the approach in the Senate bill but suggests that the dollar threshold for a covered project be adjusted for inflation on a periodic basis. Additionally, we would suggest the qualifier “new or novel” be modified to “prototype or unique technologies or designs.” While INGAA agrees with the Senate intent that activities funded via this special user fee not be included in the base budget that is defrayed by the regular user fee, this intent should be made expressly clear.

Special Permits

INGAA generally agrees with the modifications to special permit approval and review that are encompassed in this section. We suggest, however, that there be a predictable process if PHMSA proposes to modify, suspend or revoke a special permit. Such processes might include, for example:

- requiring the Secretary to consider the commercial and/or market implications of a change in pipeline operations that could result from the permit alteration, and
- providing an on-the-record hearing to the operator within a reasonable timeframe.

Maximum Allowable Operating Pressure

The Senate bill directs the Secretary to establish procedures for verifying maximum allowable operating pressure (MAOP) in populated areas. This is being done to confirm that the material strength of pipelines located in these areas is sufficient (with a margin of safety) to support those pipelines' MAOP.

INGAA can support this provision with one important modification – that the provision apply to pipelines that entered service prior to promulgation of the 1970 pipeline safety regulations. Pipelines that entered service after this date already were (and are) required to perform a hydrostatic test confirming the material strength of the pipeline. Once such a test has been completed successfully, there is no need for additional material strength tests. (This should not be confused with testing for corrosion, a time-dependent anomaly that requires periodic testing.) Since hydrostatic tests require a pipeline segment to be taken out of service for several weeks, and because this can be disruptive to pipeline customers, INGAA believes that such a requirement should be limited to instances only where the tests *truly are needed from an engineering standpoint*.

Administrative Enforcement Process

While Congress has granted PHMSA considerable enforcement authority in recent years, and now proposes to enhance that authority in the pending reauthorization bill, the “due process” required in PHMSA enforcement actions has not kept pace. PHMSA does not have the same procedures utilized by many other federal and state agencies – procedures that ensure a predictable and fair enforcement process.

S. 275 contains an important provision that directs PHMSA to develop regulations designed to ensure that pipeline operators receive a fair hearing in enforcement proceedings. The legislation instructs the agency to establish a process to assure impartiality through the designation of a neutral “presiding official” to oversee penalty assessments, corrective action orders, and related proceedings. The right to obtain a written transcript of enforcement hearings also is required to ensure transparency.

These are constructive and positive steps forward toward a common goal of impartial and timely enforcement. INGAA supports this Senate provision and commends PHMSA for opening a dialogue with us on how best to improve this aspect of its enforcement proceedings through the regulatory process. We look forward to continuing our discussion with PHMSA and hope to work with you and other interested stakeholders on refining this important provision.

Pipeline Safety User Fees

As mentioned previously, PHMSA is funded primarily through user fees assessed annually on jurisdictional liquid pipeline operators, liquefied natural gas terminal operators, and natural gas transmission pipeline operators. The statute that created the user fees in 1986⁴ specifically limits the collection of user fees from the natural gas sector to “each person operating a gas pipeline transmission facility,” with the exception of LNG terminal operators who have their own user fees. As a result, natural gas

⁴ 49 USC 60301

transmission pipeline operators are now being assessed user fees on a variety of regulatory activities that are outside the scope of transmission pipeline regulation, particularly with respect to natural gas distribution programs and state grants. These gas distribution program costs were once small. Now they are considerably larger than the costs for gas transmission activities – in fact, twice as large according to recent data from the PHMSA. This means that the natural gas transmission user fee now paid to PHMSA is three times larger than it would be if it were a genuine user fee program in which all users contributed according to cost causation.

While interstate pipelines are authorized by FERC to charge cost-based maximum rates that include the recovery of such user fees, pipelines in practice often must discount rates in order to retain business in a competitive environment. Such competition places pipelines at risk of not fully recovering the costs included in their rates, including the cost of PHMSA user fees. Given that the aforementioned PHMSA fees associated with gas distribution are not related to the transmission of natural gas, such costs should not be borne by transmission pipelines and/or their customers.

INGAA intends to engage stakeholders in developing a legislative solution for recovery of these non-transmission costs.

CONCLUSION

Mr. Chairman and Members of the Subcommittee, INGAA supports reauthorization of the Pipeline Safety Act this year. The progress being made in both chambers is encouraging. We know that pipeline safety legislation is only one part of an overall pipeline safety effort, but it is an important part. INGAA is embracing our responsibility to be safe and reliable transporters of natural gas, and we are working every day toward a goal of zero pipeline incidents. Thank you for your invitation today, and I am pleased to answer your questions.

SUMMARY OF INGAA TESTIMONY

The Interstate Natural Gas Association of America (INGAA) represents interstate natural gas transmission pipelines in the United States. Our members operate a 200,000 mile network of large-diameter pipelines that transport natural gas supplies throughout the nation. Due to the development of new domestic natural gas supplies, and an increasing demand for the clean-burning fuel, the pipeline infrastructure for natural gas has expanded significantly in the past decade, and will continue to grow.

While engineering standards have existed for natural gas transmission pipelines since the 1920s, Congress brought these pipelines under federal regulation with the enactment of the Natural Gas Pipeline Safety Act of 1968. Federal regulation and engineering standards ensure that these pipelines are designed, built, operated and maintained to a high level. Nonetheless, we recognize that our industry safety record is not perfect, and that even infrequent accidents can have tragic consequences.

Late last year, the INGAA Board of Directors decided that a fresh look at safety programs was needed. The first step was outlining aggressive goals for member companies, which include working toward a zero-incident performance level. Our five-point principles are outlined in the testimony.

While there has been much discussion in recent months about pipeline age, and whether older pipelines should be replaced simply because they are older, INGAA instead believes that the focus should be on pipeline fitness for service. Any pipeline not fit for service – regardless of age – should be repaired, replaced or retired. Age is one factor in considering whether a pipeline is fit for service, but it is not a controlling factor.

One of the INGAA guiding principles for pipeline safety is our proactive engagement with stakeholders. For example, we are actively engaged in local/state damage prevention (or “Call-Before-You-Dig”) programs. Another critical set of stakeholders are local first responders; the INGAA membership is engaged in, for example, training for first responders on handling natural gas pipeline emergencies.

Legislation introduced in the Senate (S. 275) provides a good model as the House looks to draft its own pipeline safety reauthorization bill. INGAA generally supports S. 275, and we are urging its adoption in the Senate. The INGAA testimony includes some relatively minor additions or modifications to the Senate legislation for the House to consider.



Figure 3

INGAA Guiding Principles of Pipeline Safety

IMCI

Integrity Management Continuous Improvement

1

Our goal is zero incidents
a perfect record of safety and reliability for the national pipeline system.
We will work toward this goal every day.

2

We are committed to a safety culture as a critical dimension to **continuously improve** our industry's performance.

3

We will be relentless in our pursuit of **improving by learning** from the past and anticipating the future.

4

We are committed to apply integrity management principles on a **system-wide** basis.

5

We will engage our stakeholders,
the local community to the national level
- so they understand and can **participate in reducing risk.**

Mr. WHITFIELD. Thank you. Mr. Dippo, you are recognized for 5 minutes.

STATEMENT OF CHARLES F. DIPPO

Mr. DIPPO. Good morning, Mr. Chairman and members of the Committee. I am Charles Dippo, Vice President of South Jersey Gas, and Chairman of the American Gas Association Operation Section. I am here testifying today on behalf of AGA, which represents 200 local energy companies that deliver clean natural gas to more than 64 million customers throughout the United States.

Industry has demonstrated it can increase the delivery of natural gas while continuously improving safety. Data from PHMSA shows serious incidents and leaks have been reduced by nearly 50 percent over the last 20 years but clearly more needs to be done. The tragic incident in San Bruno reminds us that one accident is too many. The NTSB has not issued a final report on the San Bruno incident, but the industry is already taking away important lessons from the information that has been produced thus far in the extensive investigation.

The factual reports show that the event appears to be an isolated incident with no evidence of national system safety problems. Nevertheless, pipeline operators are assessing their systems to determine if the circumstances encountered in San Bruno bear any similarity to their operations.

The pipeline industry leadership has joined Transportation Secretary LaHood in his call to action to repair, replace, or rehabilitate the highest-risk infrastructure and to raise the bar on pipeline safety. How do we raise the bar on pipeline safety? First, we must keep our focus on key initiatives that are showing success. This includes distribution and transmission integrity management, control room management, public awareness, excavation damage prevention, and voluntary initiatives such as AGA's Best Practices program.

Second, we have an opportunity to enhance safety through better excavation damage prevention programs, establishing a data quality committee, reducing hurdles to implementing new technology, adopting the latest consensus standards, and enhancing pipeline safety legislation. One key safety initiative is distribution integrity management. This comprehensive regulation provides an added layer of protection to the already-strong safety programs executed by distribution companies. Operators are given until August 2011 to write and being implementation of their individual risk-based programs and are already aggressively implementing this rule.

Excess flow valves, EFVs, have another added layer of safety. AGA supported the 2006 congressional mandate and most operators were voluntarily installing EFVs well before the congressional deadline. However, due to the inherent uncertainties and complexities associated with service lines for multiple-family dwellings, commercial and industrial customers, it is inadvisable to attempt mandatory installation of EFVs beyond single-family homes. PHMSA should be given adequate time to finish its technical analysis and complete the final rule-making process.

Excavation damage represents the single-greatest threat to gas distribution, safety, reliability, and integrity. AGA supports legisla-

tion that will require a state one-call program to have appropriate participation by all underground operators and excavators, including government entities; to have flexible and effective enforcement; and prohibit exemption of municipalities, state agencies, or their contractors from the one-call requirements.

AGA also believes pipeline safety can be improved through an independent review and analysis of the data collected by DOT. AGA recommends the creation of a data quality team that mirrors PHMSA's technical advisory committees. This team would analyze and improve upon the data collected by DOT, identify areas where the data tells us there is an opportunity to improve pipeline safety, and to communicate consistent messages about what the data is telling us.

AGA supports continued funding of research, development, and deployment of new technologies, as well as the refinement of current technologies that are essential to improving pipeline safety. We recommend that emphasis be placed on the deployment of new technologies and the reduction of regulatory barriers operators currently face when attempting to implement new technologies.

The industry is presently restricted by federal pipeline safety regulations that require operators to follow obsolete standards as they relate to pipeline safety. AGA suggests that Congress consider legislation to require DOT to codify within 2 years the most recent addition of a standard that DOT has adopted into the pipeline safety code.

Finally, it has been suggested that the transmission integrity management program be changed to eliminate high-consequence areas, thus requiring integrity management assessments on all transmission pipelines. AGA believes this would be contrary to the intent Congress had for the program, which was to focus resources on areas where an accident could do the most damage.

AGA believes it is reasonable for Congress to direct DOT to evaluate the effectiveness of transmission integrity management program within 2 years of the completion of the baseline assessments. This study could include evaluations of maximal allowable operating pressure, potential expansion of high-consequence areas, installation of remote or automatic shutoff valves, and expansion to areas of seismic activity.

In conclusion, the natural gas utility industry has a strong safety record and we are committed to working with all stakeholders to improve. To that end, we applaud this committee's focus on moving pipeline safety reauthorization forward. Passage of this important bill this year will help us all achieve a common goal: to enhance the safe delivery of this vital energy resource.

Thank you.

[The prepared statement of Mr. Dipppo follows:]

WRITTEN TESTIMONY OF

**CHARLES F. DIPPO
VICE PRESIDENT, ENGINEERING SERVICES AND SYSTEM INTEGRITY
SOUTH JERSEY GAS COMPANY**

**ON BEHALF OF THE AMERICAN GAS ASSOCIATION
400 NORTH CAPITOL, NW
WASHINGTON, DC 20001**

**BEFORE THE U.S. HOUSE
SUBCOMMITTEE ON ENERGY AND POWER**

Good morning, Mr. Chairman and members of the Committee. I am pleased to appear before you today and wish to thank the Committee for calling this hearing. Pipeline safety is a critically important issue, and I commend you for not only holding this hearing, but for all the work that you and your colleagues have done over the years to ensure that America has one of the safest, most reliable pipeline system in the world.

I am Charles Dippo, Vice President of South Jersey Gas, and Chairman of the American Gas Association (AGA) Operating Section. South Jersey Gas serves customers in 112 municipalities spanning in excess of 2,500 square miles, or one-third of the geographic area of New Jersey, in which one-eighth of its population resides. The service area includes all of Atlantic, Cape May, Cumberland and Salem counties and parts of Burlington, Camden and Gloucester counties. South Jersey supplies its customers through approximately 12,000 miles of distribution and 122 miles of transmission pipeline.

I am here testifying today on behalf of the AGA, which was founded in 1918, and represents 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 70 million residential, commercial and industrial natural gas customers in the U.S., of which 91 percent — more than 64 million customers — receive their gas from AGA members. AGA is an advocate for natural gas utility companies and their customers and provides a broad

range of programs and services for member natural gas companies, pipelines, marketers, gatherers, international natural gas companies and industry associates.

Natural gas pipelines, which transport approximately one-fourth of the energy consumed in the United States, are an essential part of the nation's infrastructure. Natural gas is delivered to customers through a safe, 2.4-million mile underground pipeline system. This includes 2.1 million miles of local utility distribution pipelines and 300,000 miles of transmission pipelines that stretch across the country, providing service to more than 175 million Americans. The recent development of natural gas shale resources has resulted in abundant supplies of domestic natural gas, which has meant affordable and stable natural gas prices for our customers. America needs clean and abundant energy and America's natural gas provides just that. This has made the safe, reliable and cost-effective operation of the natural gas pipeline infrastructure even more critically important, as it is our job to deliver the natural gas to the customer.

CRITICAL PIPELINE INFRASTRUCTURE

AGA believes that the domestic abundance of natural gas and the resulting price stability, when combined with the other advantages of natural gas—including its environmental attributes and efficiency of use—presents us with an unprecedented opportunity. There is direct use of natural gas in core residential and commercial markets, expanding use for gas-fired electric generation, and the transportation market where natural gas vehicles can displace some traditional diesel- and gasoline-based vehicles. These actions will save consumers billions of dollars in related energy costs, reduce greenhouse gas emissions and enhance America's energy security by reducing our reliance on imported oil. Our industry can help meet America's need for clean and abundant energy by delivering more of America's fuel -- natural gas -- not just in 2011 but well into the future. Indeed, natural gas should now be considered a foundation fuel for the country.

Shale production grew from about 1 billion cubic feet (Bcf) per day in 2000 to about 15 Bcf per day by year-end 2010, thus forming nearly twenty-five percent of all domestic dry natural gas production. U.S. shale gas production is now spread between Appalachian states, the mid-continent, Texas, Louisiana, Arkansas and even the Michigan basin. The pipeline infrastructure is being expanded to accommodate large shale gas resources in the Northeast and other parts of

the nation. As shale production and the natural gas infrastructure grows to take advantage of this abundant resource, it must be done with a focus on safety. The AGA Board of Directors recently adopted principles for Responsible Natural Resource Development (see Exhibit 4). These principles address a foundation for the sustainable and responsible development of all natural gas resources in our country and underscore the commitment of local natural gas utilities to the communities they serve. Not only will this significant production help to ensure a stable supply of natural gas, it will also provide new jobs. Estimates are that in the Marcellus Shale region alone in 2011, 122,000 new jobs will have been directly and indirectly created. All told, 2.8 million people are directly or indirectly employed by the natural gas industry.

Industry's Demonstrated Commitment to Safety

The industry has demonstrated that it can increase the delivery of natural gas while continuously making improvement in safety. The data from the Department of Transportation's Pipeline & Hazardous Materials Safety Administration (PHMSA) on Exhibit 1 shows a continual downward trend in pipeline incidents of approximately 10% every three years. AGA has analyzed data from the PHMSA database and Exhibit 2 shows that leaks, serious incidents, and significant incidents are continually being reduced.

Over the last twenty years, we have seen improvements in leak reduction (49%), as well as significant incidents (29%) and serious incidents (49%). But clearly more needs to be done. The tragic incident in San Bruno, California reminds us that one accident is one too many. The National Transportation Safety Board has not issued a final report on the San Bruno incident, but the industry is already taking away important lessons from the information that has been produced thus far in the extensive investigation. There are 210 documents with more than 6,000 pages of information in the NTSB docket. The factual reports show that the event appears to be an isolated incident with no evidence of national systemic safety problems. From the NTSB factual reports and the Report of the Independent Review Panel San Bruno Explosion, by Jacob Consultancy, we know the following:

- Stringent pressure tests at pipe mills have been required for natural gas transmission pipe since the 1940s. The pipe is pressure tested at the mill at significantly higher pressure than it will ever be operated.

- Most transmission pipe is constructed in lengths manufactured of not less than 20-foot sections. The failed pipeline segment in San Bruno contained six short sections of pipe, known as pups. The yield strength of the pipe material for four of the six pups was significantly less than the Pacific Gas & Electric (PG&E) pipe mill order requirement for the original construction project. The specification required that the yield strength of the pipe material to be at least 42,000 psi (API Grade X42). Four of the six pups tested have yield strengths suggesting a material strength of only 32,000 psi, which is 10,000 psi below the required minimum pipe specifications of that project.
- The longitudinal seam welds were not of the quality of double submerged arc welded (DSAW) long seams typical of large diameter pipe manufactured during the 1948 to 1956 time period, for the material specified in the original construction project. Instead, the long seams of the pups segments were incomplete penetration welds made with unusual weld preparations and non-standard welding techniques not seen in the manufacture of natural gas transmission pipeline pipe.
- The original pipe was constructed in 1948 and part of the pipeline, including the failed segment, was relocated in 1956. The remaining segments of pipe were in good condition with little evidence of internal or external corrosion.

A report by the Interstate Natural Gas Association of America (INGAA), "Preliminary Analysis of Publicly Available Evidence Supporting a Failure Cause of the PG&E San Bruno Incident", suggests the manufacturing defect by itself did not cause the incident. The pipeline, even with defective welds and substandard materials, was "stable" for the over 50 years of its existence. The Jacob Consultancy Report work confirms INGAA's findings. Both INGAA and the independent reviewers consultant's analysis support the theory there was an external force that triggered the manufacturing defect to propagate, causing the pipe to fail; the force that most likely put the increased stress on the longitudinal seam was the force from a 2008 sewer replacement project undertaken by the city of San Bruno that utilized pipe bursting technology in very close proximity to the PG&E pipeline. Both the Panel and INGAA believe third-party activity (activity that was proximate to the pipe, but without direct contact that would have led to visible immediate damage) could have played a key role in transforming a "stable" threat to an "unstable" threat, thus triggering the incident.

Pipeline operators are assessing their systems to determine if the circumstances encountered in the San Bruno incident investigation bear any similarity to their operations. AGA surveyed operators throughout the nation and no one reported encountering DSAW pipe without an

internal longitudinal seam weld, although one operator reported finding DSAW pipe with a poor internal seam weld. This pipe had been removed from service years ago. The California Public Utility Commission (CPUC) and operators in California have taken steps to address safety issues identified and are holding public hearings and workshops.

Other steps have been taken nationally to prevent a similar incident from occurring. The NTSB issued 10 safety recommendations to PHMSA, the CPUC and PG&E. PHMSA issued a safety advisory bulletin to all pipeline operators. AGA's members have been actively following the developments of the San Bruno investigation and have been considering how that information should be used to reduce the probability of a similar incident on their system. AGA held its biennial conference and exhibition for over 1800 people in the industry, and extensive presentations on the technical issues related to the San Bruno incident were presented.

Concurrent with the above discussed actions, the pipeline industry leadership has joined the Secretary of Transportation, Ray LaHood, in his call to action to repair, replace or rehabilitate the highest risk infrastructure. AGA member company CEOs met with Secretary LaHood in December 2010, in February 2011, and participated in the DOT Pipeline Safety Forum on April 18, 2011. The leadership of AGA believes that commitment must start at the top in any organization or business. Our actions as leaders clearly demonstrate that we are fully committed to achieving the goal of improving pipeline safety.

Exhibit 3 shows the commitment to safety from the top at the American Gas Association. It begins with the Board of Directors who guides four key safety areas: The Board Safety Committee, Board Safety Implementation Task Group, Government Relations Policy Committee and Operations Managing Committee. The Board Safety Committee was established five years ago and focuses on pipeline, employee, contractor and customer safety. The Board's Safety Implementation Task Group brings together key committees focused on safety, including AGA's Legislative, Legal, State Regulatory, Communications, and Operations Committees. The Government Relations Policy Committee provides oversight of advocacy initiatives and identifies emerging issues. The Operations Managing Committee leads 16 technical and

advocacy committees with special emphasis on identifying and sharing best practices and lessons learned. For AGA and its member companies, safety is first and foremost.

RAISING THE BAR FOR SAFETY

How do we raise the bar on safety? First, we must keep our focus on key safety initiatives that are already underway and are showing success. This includes Distribution and Transmission Integrity Management, Control Room Management, public awareness, excavation damage prevention, and a number of voluntary initiatives such as AGA's Best Practices Program. Second, we have an opportunity to work together with state and federal regulators to further elevate pipeline safety through better excavation damage prevention programs and eliminating or severely reducing exemptions that currently allow entities not to call before they excavate, establishing a data quality committee to analyze DOT pipeline performance information, reducing hurdles that prevent operators from implementing new technology, requiring PHMSA to update obsolete material construction consensus standards that are currently incorporated by reference, and passing a pipeline safety bill that focuses on key areas that can truly improve pipeline safety.

Distribution Integrity Management

The 2006 PIPES Act required DOT to establish a regulation prescribing standards for integrity management programs for distribution pipeline operators. The DOT published the final rule establishing natural gas distribution integrity management program (DIMP) requirements on December 4, 2009. The effective date of the rule was February 12, 2010. Operators are given until August 2, 2011 to write and begin implementation of their individual risk-based program.

In 2003, PHMSA previously implemented integrity management regulations for hazardous liquid and gas transmission pipelines. Because there are significant differences between gas distribution, gas transmission and hazardous liquid pipelines, it would have been impractical to apply the existing hazardous liquid or gas transmission regulations to distribution pipelines. The DIMP rule incorporated the same basic principles as transmission integrity management regulations, but with a slightly different approach to accommodate differences between transmission and distribution systems. The DIMP final rule requires operators to develop and

follow individualized integrity management (IM) programs, in addition to PHMSA's other current pipeline safety regulations.

The DIMP final rule is a comprehensive regulation that provides an added layer of protection to the already-strong pipeline safety programs implemented by local distribution companies. It represents the most significant rulemaking affecting natural gas distribution operators since the inception of the federal pipeline safety code in 1971. It will impact more than 1,300 operators, 2.1 million miles of piping, and 70 million customers. The final rule effectively takes into consideration the wide differences that exist between natural gas distribution operators. It also allows operators to develop a DIMP plan that is appropriate for the operating characteristics of their distribution delivery system and the customers that they serve.

The final rule requires that all distribution pipeline operators, regardless of size, implement an integrity management program that contains seven key elements:

1. Develop and implement a written integrity management plan.
2. Know its infrastructure.
3. Identify threats, both existing and of potential future importance.
4. Assess and prioritize risks.
5. Identify and implement appropriate measures to mitigate risks.
6. Measure performance, monitor results, and evaluate the effectiveness of its programs, making changes where needed.
7. Periodically report performance measures to its regulator.

Operators are aggressively implementing this rule. Workshops have been conducted throughout the nation. Webinars and audio conference have been held. Software programs have been developed specifically for distribution integrity management. The Gas Pipeline Technology Committee, comprised of federal and state regulators, pipeline operators, manufacturers, and the public, has developed a guidance document to implement the DIMP regulation. PHMSA and state regulators have completed pilot audits, created an audit form that has been shared with operators, and recently held webinars for hundreds of operators. I am pleased to inform the committee that all affected stakeholders are working to make this an effective regulation.

Excess Flow Valves (EFVs)

Natural gas utilities have been installing EFVs widely on single family residence service lines since the late 1990s, when operators were given the option of either installing them voluntarily or notifying customers of their availability, and then installing them upon request. The 2006 PIPES Act mandated that DOT require natural gas distribution utilities install an EFV on new and replacement service lines for single family residences, if the service line met specific conditions, beginning on June 1, 2008.

AGA supported the 2006 Congressional mandate for EFVs. Indeed, most operators were voluntarily installing EFVs before the June 2008 Congressional deadline. The DIMP final rule codified the congressional mandate to install EFVs in services to single-family residences. I do want to emphasize that Congress was absolutely correct in limiting the EFV mandate to single-family residential dwellings. Single family residence dwellings are very uniform and only about 15 percent of the dwellings have characteristics that prevent EFV installation (e.g. pressure too low, dirt, or contaminants in the gas).

However, due to the inherent uncertainties and complexities associated with service lines to multiple-family dwellings, commercial and industrial customers, it is inadvisable to attempt mandatory nation-wide installation of EFVs beyond the single-family residential class. Multifamily dwellings, commercial, and industrial customers are subject to significant variations in gas loads. Since EFVs are designed to shut down when there is a significant change in gas flow, these variations could result in the inadvertent closure of an EFV and interruption of gas service for multiple days. An inadvertent EFV shutoff of commercial and industrial facilities, like hospitals or chemical plants, could potentially result in a greater safety hazard(s) than the release of gas the EFV was attempting to prevent.

Industry is committed to working with DOT on the use of new safety devices. However, given that small commercial services have yet to be defined and only one or two operators have ever used large volume EFVs, PHMSA should be given adequate time to finish its technical analysis and complete the advanced notice, notice and final rulemaking process.

Control Room Management

In December 2009, DOT promulgated the final regulation for Pipeline Control Room Management. The final rule requires pipeline operators to develop, implement and submit a management plan designed to reduce risks associated with the human factors of employees working in a pipeline control room. As a part of their plan, pipeline operators must address fatigue issues and establish a maximum limit on the number of hours worked by pipeline controllers.

AGA commends DOT for putting forth a final rule that enhances safety and is practical, reasonable, and cost-effective. Similarly to the DIMP, the rule takes into consideration the inherent differences that exist between natural gas pipeline operators and hazardous liquids pipeline operators. There has never been a documented accident that has been directly caused by the controller of a natural gas pipeline. Yet, AGA and its members are supportive of the regulation and are active in working to develop national standards that identify recommended practices for pipeline operators to consider in developing their plan. The final rule actually goes beyond the Congressional mandate in the area of controller fatigue by requiring operators to:

- Establish shift lengths and schedule rotations that provide controllers off-duty time sufficient to achieve eight hours of continuous sleep;
- Educate controllers and supervisors in fatigue mitigation strategies and how off-duty activities contribute to fatigue; and
- Train controllers and supervisors to recognize the effects of fatigue.

The NTSB has expressed its support of the new regulation by closing its recommendation for pipeline operators to address fatigue. On February 18, 2010, the NTSB issued a press release that stated: "The Board was pleased to report that the Pipeline and Hazardous Materials Safety Administration has published a final rule establishing new basis for managing fatigue in the pipeline industry." The Board called the rule "a significant step forward for an industry that did not previously have any rules governing hours of service." The Board closed the recommendation "Acceptable Alternate Action" and has removed fatigue in the pipeline industry from its "Most Wanted" list.

AGA and its members supported PHMSA's proposed rule to expedite the implementation of the control room management final rule requirement by more than 18 months. Most of the rule elements will be implemented by August 2011, while new personnel will be added to satisfy the fatigue management and training requirements by August 2012. In addition, operators are reviewing all of their control room policies and procedures to identify changes that can be made to better manage gas control operations.

In preparation for the August 2011 deadline for control room management plan development, operators, federal regulators and state regulators have focused extensive efforts on education and training. Natural gas operators were included in a series of pilot audits that allowed regulators to finalize their compliance guidance. The operators who participated in the pilot audits provided additional information that was needed to better clarify the reasons for variances in control room operations and the processes in place to augment pipeline safety. AGA and its members will continue to work with federal and state regulators to determine how control room operations can contribute to the shared goal of continually improving pipeline and public safety.

ENHANCED SAFETY PRACTICES

As stated at the DOT Pipeline Safety Forum, operators can increase safety through:

- The exchange of best practices and the sharing of lessons learned from incidents and near misses,
- By working more closely with emergency responders and the public on natural gas safety and
- Collaborating with all stakeholders on key initiatives that have the ability to truly improve pipeline safety.

AGA has a comprehensive best practices program for its members and is exploring other ways to share practices and lessons learned. In addition, AGA recommends that PHMSA establish a data quality team made up of representatives from government, industry and the public to analyze and improve upon the data collected by DOT and identify areas where the data tells us safety can be improved,

Excavation Damage Prevention

Excavation damage represents the single greatest threat to gas distribution system safety, reliability and integrity. A number of initiatives have helped to reduce excavation damage and resulting incidents. These include a new nationwide three digit number, “811”, that excavators can use to call before they dig, a nationwide education program promoting 811, “best practices” to reduce excavation damage and regional “Common Ground Alliances” that are focused on preventing excavation damage. Additionally, AGA and other partners have established April as National Safe Digging Month, encouraging individuals to dial 811 before embarking on any digging or excavation project. Since the “Call 811” campaign was launched, there has been approximately a 40 percent reduction in excavation-related incidents. A significant cause for this reduction is the work done by the pipeline industry in promoting the use of 811. Regulators, natural gas operators, and other stakeholders are continually working to improve excavation damage prevention programs.

AGA supports amendments to legislation that will require a state one-call program to have appropriate participation by all underground operators, including government entities; have mandatory participation by all excavators, including governments and contractors; have flexible and effective enforcement; and prohibit exemption of municipalities, State agencies or their contractors from one-call notification system requirements.

Risk-based Data Driven Safety

AGA believes pipeline safety can be improved through an independent review and analysis of the data collected by the DOT. To conduct this review and analysis, AGA recommends that Congress require DOT to create a data quality team made up of representatives from government, industry and the public that mirrors PHMSA’s technical advisory committees or the Plastic Pipe Database Committee. This team would analyze and improve upon the data collected by DOT, identify areas where the data tells us there is an opportunity to improve pipeline safety and communicate consistent messages about what the pipeline data is telling us. No single entity can effectively analyze and communicate national performance data. The public, industry and other pipeline stakeholders should be involved in analyzing the data, drawing conclusions, and recommending actions for improvement.

Research & Development and Consensus Standards

We support the continued funding of research, development and deployment of new technologies, as well as the refinement of current technologies, which are essential to improving pipeline safety. In addition, it is critical that the information gained through research, development and deployment be shared so that we can improve our collective understanding of the factors that can influence the risk assessment process which drives decisions to repair, rehabilitate, replace or retire a line. We recommend more emphasis be placed on the deployment of new technologies, and reducing the regulatory barriers operators currently face when attempting to implement new technologies, because too often that is where good research and development projects lose their momentum.

Additionally, it is important to manage construction and maintenance practices using the latest accepted practices and material standards. Polyethylene pipe is the material of choice when installing a gas distribution line because it not susceptible to corrosion that occurs in metal pipe. Unfortunately, the industry is presently restricted by federal pipeline safety regulations that require operators to follow the obsolete 1987 and 1999 editions of ASTM D2513 *Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings*. Material standards are typically revised every five years and AGA has petitioned PHMSA to incorporate by reference the most current 2009 edition of ASTM D2513.

Material standards, such as those for steel and plastic pipe, are developed to regulate the manufacturing process and infrastructure installation nationally and worldwide. The United States should not be hindered by a requirement to follow obsolete material standards as they relate to pipeline safety. AGA suggests that Congress consider language in its legislation to require PHMSA to codify all, or part, of the most recent edition of a standard that has already been adopted by DOT into the pipeline safety code within two years after the last revision has been issued whenever feasible.

High Consequence Areas

It has been suggested that the Transmission Integrity Management Program (TIMP) be changed, and that the High Consequence Areas (HCA) definition be eliminated, thus requiring operators to perform TIMP assessments for all 300,000 miles of natural gas transmission pipelines. AGA believes that this would be contrary to the intent Congress had for the program, which was to focus resources on densely populated and environmentally sensitive areas where an accident could do the most damage.

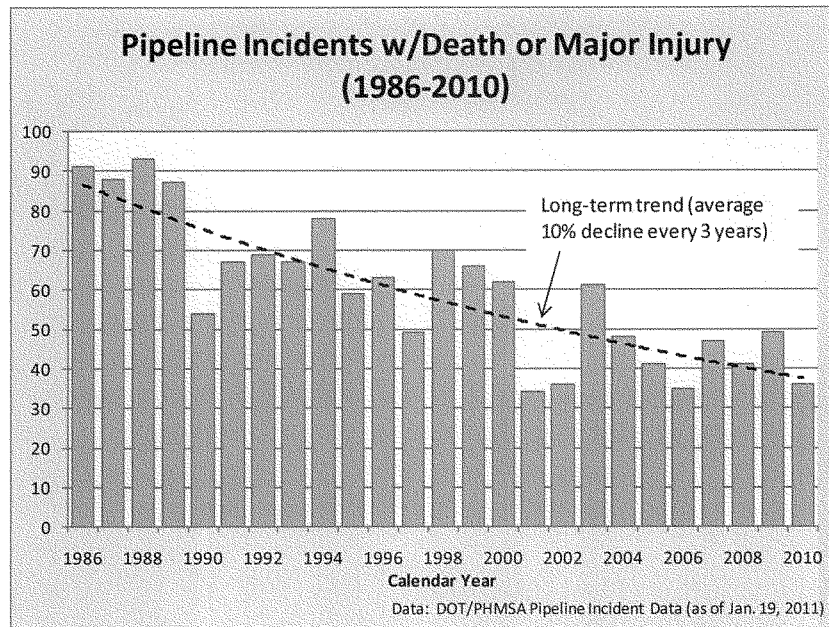
All pipelines must comply with stringent state and federal safety standards even before the TIMP program is applied. As part of its regulation on TIMP, DOT has already included provisions for pipeline operators to have an added layer of protection on low-stress pipelines outside of HCAs. These provisions are known as Preventive and Mitigative (P&M) measures and are contained in Subpart O of the Federal Pipeline Safety Code. These P&M measures include enhanced protection against the threats of external and internal corrosion, as well as third party excavation damage. The TIMP program is relatively new as the regulation was only finalized in December 2003 and the initial baseline assessment of all covered transmission pipelines will not be completed until December 2012. AGA believes it is reasonable for Congress to direct the DOT to evaluate the effectiveness of the integrity management program within two years of the completion of the baseline assessments. The study could include reviewing existing integrity management safety measures, including:

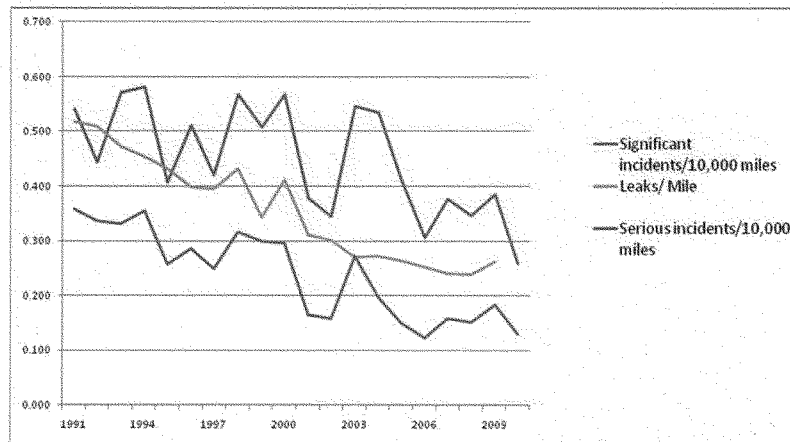
- Evaluations of maximum allowable operating pressures,
- Potential expansion of HCAs,
- Installation of remote control or automatic shut-off valves, and
- Expansion to areas of seismic activity.

Summary

In conclusion, the natural gas utility industry has a strong safety record. Recognizing the critical role that natural gas can and should play in meeting our nation's energy needs, we are committed to working with all stakeholders to improve. To that end, we applaud this committee's focus on moving pipeline safety act reauthorization forward. Passage of this important bill this year will help us all achieve a common goal: to enhance the safe delivery of this vital energy resource.

Exhibit 1

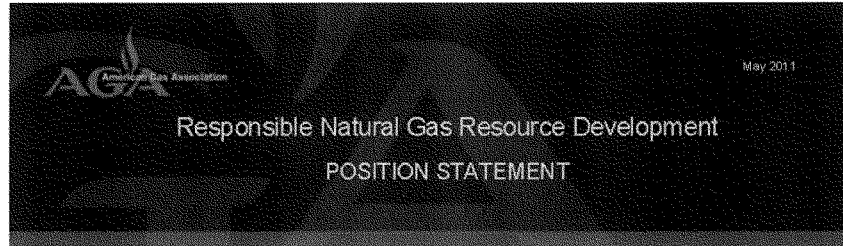


Distribution Safety Performance Leaks & Incidents

Note: Leak and mileage data for 2010 is not yet available. 2010 Incidents are per 10,000 miles using 2009 miles

Exhibit 3 – Gas Distribution Industry Leadership Structure





The American Gas Association (AGA) believes that the benefits of developing the abundant and clean natural gas energy resource in America can and should be realized. We also believe it can be developed in a responsible manner. Over the past several years a truly game-changing event has occurred in the natural gas industry thanks to improved technologies that are allowing energy producers to access significant and growing supplies of domestic natural gas from shale formations and other unconventional reservoirs. As a result, for the foreseeable future the natural gas supply picture looks extremely bright, both for the industry and for natural gas customers. Recently, the completion practices required to produce natural gas, specifically from shale formations, have attracted considerable attention in both the media and public policy circles. Safe and reliable extraction, transport and delivery of natural gas to consumers remain the first priority for all natural gas industry participants. These principles address a foundation for the sustainable and responsible development of all natural gas resources in our country and underscore the commitment of local natural gas utilities to the communities they serve.

AGA's natural gas utility members deliver natural gas to approximately half of all Americans, and two thirds of the natural gas consumed in the nation flows through their delivery systems.

AGA believes that recognition of the following principles is essential to sustainable and responsible development of natural gas in the United States:

- *As the representative of local utility businesses that were founded on principles of safety and community stewardship, we and our members believe it is critical to engage all stakeholders in the process of meeting economic, environmental and regulatory goals, to share information transparently, and—based on lessons learned—to continually refine and improve safety and environmental practices.*
- *Natural gas from shale formations has contributed to domestic natural gas production since the 1960s. Recently, steady technological advancements associated with horizontal drilling and hydraulic fracturing have made it increasingly cost effective to produce shale gas, which has resulted in a significant increase in domestic natural gas production since 2007.*
- *Consumers benefit enormously from the tremendous growth of this new natural gas supply, which has made natural gas prices reliably low and stable. Under current projections even sudden or significant shifts in demand—weather induced or otherwise—should have no appreciable effect on natural gas prices.*

1

Exhibit 4

Mr. WHITFIELD. Thank you, Mr. Dipbo. Mr. Swift, you are recognized for 5 minutes.

STATEMENT OF ANTHONY SWIFT

Mr. SWIFT. Thank you, Chairman Whitfield, Ranking Member Rush, and members of the committee. I am a policy analyst for Natural Resources Defense Council. NRDC is a national nonprofit organization dedicated to protecting public health and the environment. As a personal note, coming from West Texas in a family with 4 generations in the oil and gas industry, I value the opportunity that allows me to participate in the critical process and ensures the industry's infrastructure is held to the highest standards of safety.

Over the last few years, the U.S. hazardous liquid pipeline system has been used to transport a substance called diluted bitumen from the tar sands region of Canada. By itself, bitumen is virtually solid at room temperature. To move it through a pipeline, producers must dilute it with light, highly volatile natural gas liquids. The thick, abrasive mixture called diluted bitumen is then pumped through pipelines at high pressure generating enough friction to reach temperatures of up to 150 degrees. Over the last decade, imports of diluted bitumen have increased six-fold, yet regulators haven't moved to assess its risk, including both the potential for increased spill frequency, as well as greater safety risks when those spills occur.

The U.S. pipeline system may already be showing signs of strain. For example, pipelines in Midwestern States, which have the longest history of transporting Canadian tar sands crude has filled nearly 3 times more crude per mile than the national average over the last 4 years.

Enbridge transports the majority of Canadian diluted bitumen to the United States. In 2010, its Lakehead System had over a dozen spills, accounting for more than half of all crude oil spilled in the United States that year. Meanwhile, TransCanada's Keystone pipeline, one of the first pipelines dedicated to move tar sands crude from Canada to the United States, has had 12 leaks in less than 12 months of operation, the largest of which was approximately 21,000 gallons. Keystone is the newest liquid pipeline system to ever be deemed by PHMSA an immediate threat to life, property, and the environment.

During a spill, natural gas liquids and diluted bitumen may increase the risk of explosion and exposure to toxic vapors. As the 840,000 gallons spilled into Kalamazoo appears to have confirmed, in a spill, diluted bitumen behaves differently than conventional crude requiring different, more expensive, and time-consuming cleanup methods than conventional crude oil spills. These are early warning signs that present a compelling case that more study is needed on the risks of diluted bitumen.

Building TransCanada's Keystone XL, a high-pressure pipeline that would move up to 830,000 barrels per day of hot, corrosive, diluted bitumen through the heart of the Ogallala Aquifer creates hazards that a conventional crude oil pipeline does not. The Ogallala Aquifer is a critical source of fresh water for the United States, provides 30 percent of our irrigation water and drinking water for millions of Americans. A spill in the deepest part of that

aquifer in the Nebraska Sandhills could be a disaster. Given the limits of leak-detection technology, which on a pipeline like Keystone XL could allow a leak of hundreds of thousands of gallons a day to go unnoticed, the worst-case scenario is simply one we cannot afford.

NRDC recommends the following actions. First, Congress should require PHMSA to conduct a detailed study of diluted bitumen. This study should include both the risks of increased spill frequency, as well as unique hazards that such spills may pose to public safety and the environment.

Second, PHMSA should be actively engaged in all stages of major pipeline infrastructure development. This includes issuing comments during environmental review for significant pipeline projects such as the proposed Keystone XL pipeline. It should be noted that it is the quality and not the time spent conducting environmental reviews that ensures the safety of new projects.

Finally, Congress should direct PHMSA to develop necessary regulations to protect our major fresh water resources like the Ogallala Aquifer from pipeline spills. Under current pipeline safety regulations, aquifers like the Ogallala receive the lowest level of federal oversight. During the Gulf spill, we witnessed the sad consequences that come of allowing an accident-prone company to replace expensive but prudent safety measures with reckless optimism. Let us not court a similar disaster in the deepest waters of our Nation's greatest aquifer.

Once again, NRDC thanks you for the opportunity to present its views and I would be pleased to answer any questions you may have.

[The prepared statement of Mr. Swift follows:]

Summary of Testimony by Anthony Swift, Natural Resources Defense Council

The U.S. onshore hazardous liquid pipeline system is receiving higher volumes of new, more corrosive form of crude oil called diluted bitumen. These blends have properties which pose potential new risks to the U.S. onshore liquid pipeline system, public safety and the environment. Pipeline regulators have not assessed the risks of this new product or considered whether new pipeline safety and spill response regulations will be necessary to protect the public and environment.

Timely federal action is urgently required, as an increasing amount of diluted bitumen comes into our nation through existing pipelines that may not be sufficiently designed to handle it. It is critical that the risks of this product inform agencies conduct environmental review, make siting determinations and consider design and safety requirements for new pipelines such as TransCanada's Keystone XL.

Actions which may address the specific risks of potentially corrosive products such as diluted bitumen include, but are not limited to:

- Evaluate the nature and magnitude of new risks posed to pipelines and hazards created by spills. Regulations should be updated accordingly.
- Ensure active engagement by PHMSA in all stages of pipeline infrastructure development.
- Expand protections for at risk resources, including open-source aquifers such as the Ogallala.



Testimony of

**Anthony Swift
Policy Analyst, International Program
Natural Resources Defense Council**

Before the

**House Committee on Energy and Commerce
Subcommittee on Energy and Power**

**Committee on
Energy and Commerce
United States House of Representatives**

June 16, 2011

TESTIMONY OF ANTHONY R. SWIFT
POLICY ANALYST, INTERNATIONAL PROGRAM
NATURAL RESOURCES DEFENSE COUNCIL

HEARING ON "PIPELINE SAFETY OVERSIGHT"
BEFORE THE SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

June 16, 2011

Chairman Whitfield and Ranking Member Rush, and Members of the Committee, thank you for the opportunity to testify today on pipeline safety oversight. My name is Anthony Swift. I am a policy analyst for the Natural Resources Defense Council (NRDC) specializing in energy issues. Since the Enbridge pipeline spill last summer in Michigan, I have been studying the safety implications of diluted bitumen or raw tar sands crude transported through existing pipeline technology. NRDC is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 1.2 million members and online activists worldwide, serviced from offices in New York, Washington, Los Angeles, San Francisco, Chicago, and Beijing.

Introduction

Pipeline safety is of major concern in the United States today. A recent series of pipeline disasters has increased public awareness regarding the potential dangers of diluted bitumen to the U.S. hazardous liquid pipeline system. Diluted bitumen is a corrosive, acidic and potentially unstable blend of thick raw bitumen and volatile natural gas liquid condensate. Last year's pipeline spill of over 840,000 gallons of diluted bitumen into the Kalamazoo River in Michigan demonstrated just a few of the risks associated with transporting corrosive, acidic and unstable

diluted bitumen in aging pipelines. These concerns have been intensified by the rapid increase of diluted bitumen imports into the United States in recent years.

Chemical assays of diluted bitumen blends, reports from refiners receiving diluted bitumen, large spills in the United States and Canada involving diluted bitumen or pipelines that carry it as part of their product mix, and the safety record of the Alberta pipeline system are large warning signs of the risk of transporting bitumen blends. Responsible federal officials need to address these serious questions as part of the environmental review of the project.

Diluted bitumen is much thicker, or viscous, than conventional crude and must be pumped through a pipeline at high pressure. As thick, abrasive diluted bitumen moves through the pipeline, it generates significant friction, which heats the pipeline. For instance, TransCanada's proposed Keystone XL pipeline would run at temperatures of up to 150 degrees Fahrenheit. It is typically diluted with light, highly volatile natural gas liquids which increase the risk of explosion in the event of a spill. We have learned the hard way that relying on conventional technologies and equipment to drill and complete a deep offshore well in the Gulf of Mexico introduces risks that drilling a well in West Texas does not. TransCanada's Keystone XL pipeline, which would move 830,000 barrels per day of hot corrosive tar sands diluted bitumen through the heart of the Ogallala Aquifer, creates hazards that a conventional crude pipeline carrying light, low-sulfur crude oil through West Texas does not. This is a new technology with new potential risks. It is imperative that our pipeline safety regulators put updated regulations in place that will prevent unnecessary leaks and spills.

In my testimony this morning I will describe how volumes of diluted bitumen are increasing in the U.S. onshore pipeline system, the potential risks that this increase poses to the

environment and public safety, and gaps in the federal regulatory response to diluted bitumen transported in pipes.

The U.S. pipeline system is carrying increasing volumes of potentially corrosive diluted bitumen

Over the last few years, the U.S. onshore hazardous liquid pipeline system has been used to transport increasing volumes of corrosive grades of crude oil. During that time, pipeline regulators have not moved to assess or address the risks to the public and environment that this trend poses. While U.S. refiners have witnessed a decades-long trend of declining crude quality, most of this can be attributed to heavy sour coming into our Gulf Coast refineries from oil tankers.¹ Gulf refineries process this crude and then move it through conventional pipelines in the form of refined product, sparing much of the U.S. onshore pipeline system the wear and tear of transporting the heavier, sour crudes. Sour crudes are more corrosive and can lead to both internal and external corrosion of the pipeline. However, this is changing as the U.S. pipeline system is used to transport increasing volumes of heavy, corrosive diluted bitumen from Canada's tar sand region.

Historically, the United States has imported the majority of Canadian tar sands crude in the form of synthetic crude oil, a substance similar to conventional crude oil. It has already gone through an initial upgrading process. Importing tar sands oil into the United States as diluted bitumen—instead of synthetic crude oil—is a recent and growing development. After running short on upgrading capacity, Canadian oil producers are increasingly mixing raw bitumen, a

¹ While the API gravity and sulfur content of crudes refined in the U.S. has been increasing, a significant portion of this effect is due to the import of sour, heavy fuels into the U.S. Gulf where it is refined (U.S. Energy Information Administration, Petroleum & Other Liquids, Crude Oil Input Qualities, 2011, http://www.eia.gov/dnav/pet/pet_pnp_crq_a_EPC0_YCS_pct_a.htm).

thick, semi-solid substance, with a diluent such as a volatile natural gas liquid condensate. The hot mixture is then piped to and through the United States at high pressure.

Over the last ten years, diluted bitumen exports to the United States have increased six fold, to almost 600,000 barrels per day (bpd) in 2010— comprising more than half of the approximately 900,000 bpd of tar sands oil currently flowing into the United States.² By 2019, Canadian tar sands producers plan to increase this amount to as much as 1.5 million bpd of diluted bitumen.³

Diluted bitumen may pose an increased risk to pipeline systems

There are already many signs that diluted bitumen presents new risks to pipeline integrity and, when spilled, generate unique hazards. The physical and chemical properties of diluted bitumen blends, as well as the documented poor safety record of pipelines that have been used to carry diluted bitumen, raise serious questions that need to be addressed, particularly as an increasing amount of diluted bitumen moves through U.S. pipelines.

Heavy diluted bitumen has a number of chemical and physical characteristics which increase its risks to pipeline systems. Diluted bitumen has significantly higher sulfur content,⁴ which can lead to sulfide stress corrosion cracking,⁵ and higher chloride salt content,⁶ which can

² “Oil Sands Statistics 2000-2007,” Canadian Association of Petroleum Producers, <http://membernet.capp.ca/raw.asp?x=1&dt=NTV&e=PDF&dn=34093>; <http://www.neb-one.gc.ca/clf-nsi/rnrgvnmfntn/ststsc/crdlndptrlmpdct/stmtdendncrdlxprtpdstn-eng.html>.

³ Andy Burrowes, Rick Marsh, Marie-Anne Kirsch et al., *Alberta's Energy Reserves 2009 Supply/Demand Outlook 2010-2019*, Calgary, Alberta: Energy Resources Conservation Board, 2010, p. 3, http://www.ercb.ca/docs/products/STs/st98_current.pdf.

⁴ *Canadian Crude Quick Reference Guide Version 0.54*, Crude Oil Quality Association, 2009, <http://www.coqa-inc.org/102209CanadianCrudeReferenceGuide.pdf>.

⁵ Karl Sieradzki, Stress Corrosion Cracking, Technical Paper, <http://www.azgovernor.gov/estf/stress.pdf>.

⁶ *Planning Ahead for Effective Canadian Crude Processing*, Baker Hughes, 2010, p. 4, http://www.bakerhughes.com/assets/media/whitepapers/4c2a3c8ffa7e1c3c7400001d/file/28271-canadian_crudeoil_update_whitepaper_06-10.pdf.pdf&fs=1497549; A. I. (Sandy) Williamson, *Degradation Mechanisms in the Oilsands Industry*, Calgary, Alberta: Ammonite Corrosion Eng. Inc., 2006, Presentation to the National Association of Corrosion Engineers, slide 27,

lead to chloride stress corrosion. It also has higher quantities of highly abrasive quartz, rutile, and pyrite particles.⁷ Additionally, it is generally transported at higher temperature and pressure than conventional crudes moved through the U.S. pipeline system. The unstable blend of heavy bitumen and volatile natural gas liquid condensate create problems for leak detection and presents significant additional hazards in the event of a spill. (Exhibit 1: NRDC Technical Letter to the Pipeline and Hazardous Materials Safety Administration (PHMSA))

While the use of onshore pipelines to move large quantities of diluted bitumen is relatively recent, there are many early indications that the characteristics of diluted bitumen pose increased risks to pipeline systems. The Alberta pipeline system, which moves significant quantities of diluted bitumen, has had sixteen times more spills per mile due to internal corrosion than the older U.S. system. (Exhibit 2: Tar Sands Pipelines Safety Risks) On April 29, 2010 the Rainbow pipeline, which carries a variety of crude blends including Peace River diluted bitumen,⁸ leaked 1.3 million gallons in northern Alberta.⁹

As imports of this corrosive crude increase, the U.S. pipeline system may already be showing the strain. Midwestern states with the longest history with heavy Canadian tar sand crude are North Dakota, Minnesota, Wisconsin and Michigan.¹⁰ Over the last five years, crude oil pipelines in these states have spilled almost three times as much crude per mile than the

http://www.naccedmonton.com/pdf/FtMacPresentation/Ammonite_Degradation%20Mechanisms%20in%20OS%20Operations_NACE_Fort%20Mac_10%2006.pdf.

⁷ S.A. Lordo, "New Desalting Chemistry for Heavy/High Solids Crude," 2010, pg. 12, http://coqa-inc.org/20100211_Lordo_Solids_in_Crude.pdf.

⁸ Crude Monitor, Peace River Heavy, 2011, <http://www.crudemonitor.ca/crude.php?acr=PH>.

⁹ Dina O'Meara, *Rainbow oil pipeline leak largest in 36 years*, Calgary Herald, May 3, 2011, <http://www.calgaryherald.com/news/Rainbow+pipeline+leak+largest+years/4720888/story.html>;

¹⁰ The sulfur content and API gravity of crude transported in pipeline to refineries in the northern region of PADD II are significantly above the national average, (U.S. Energy Information Administration, Petroleum & Other Liquids, Crude Oil Input Qualities, 2011, http://www.eia.gov/dnav/pet/pet_pnp_crq_a_EPC0_YCS_pct_a.htm).

national average.¹¹ The Enbridge Lakehead System, which transports the majority of Canadian crude exported to the United States from Alberta to refineries in the Midwest,¹² was also responsible for over half of all crude oil spilled in the United States in 2010,¹³ while accounting for less than five percent of the country's crude transmission mileage.¹⁴ Prior to the 840,000 gallon diluted bitumen spill (2010) on Enbridge's line 6B in Kalamazoo, Michigan, in-line inspections revealed 329 corrosion anomalies on that line alone.¹⁵

Meanwhile, TransCanada's Keystone pipeline, one of the first pipelines dedicated to moving diluted bitumen from Canada to the United States, has had twelve leaks over the last year; its first year in operation.¹⁶ The largest of these, which occurred in May 2011 was approximately 21,000 gallons,¹⁷ a large spill by most reporting categories.¹⁸ The Department of Transportation responded this month by issuing the pipeline with a Corrective Action Order, after determining that the pipeline was an "immediate threat to life, property and the

¹¹ ND, MN, WI and MI have approximately 5,475 miles of crude pipelines, or 10.9% of the approximate 50,214 U.S. crude pipeline mileage (PHMSA, State Mileage by Commodity Statistics, 2011, http://primis.phmsa.dot.gov/comm/reports/safety/MI_detail1.html?nocache=8335#_OuterPanel_tab_4; Bureau of Transportation Statistics, Table 1-10: U.S. Oil and Gas Pipeline Mileage, 2009 http://www.bts.gov/publications/national_transportation_statistics/html/table_01_10.html). Meanwhile, between 2007-2010 crude pipelines in ND, MN, WI, and MI spilled 38,220 barrels of crude, or 30.3% of the 125,862 barrels of crude spilled in the U.S.

¹² Jeffery Jones, Enbridge eases oil shipping lines as glut shrinks, Reuters, Apr 21, 2011, <http://ca.reuters.com/article/businessNews/idCATRE73K7EO20110421>.

¹³ Enbridge spilled over 31,400 barrels of crude in a series of 18 spills in IL, MI, MN, ND and WI in 2010; making up nearly 60% of the 53,300 barrels of crude spilled in the U.S. that year.

¹⁴ The U.S. portion of Enbridge's Lakeshead system consists of 1,900 miles of liquid petroleum pipelines, comprising approximately 3.8% of U.S. crude pipeline mileage (Enbridge, LakeHead System, <http://www.enbridgeus.com/Main.aspx?id=210&tmi=210&tmt=1>; Bureau of Transportation Statistics, Table 1-10: U.S. Oil and Gas Pipeline Mileage, 2009 http://www.bts.gov/publications/national_transportation_statistics/html/table_01_10.html).

¹⁵ Todd A. Heywood, *Feds say Enbridge pipeline may never restart*, Aug 27, 2010,

<http://michiganmessenger.com/41372/feds-say-enbridge-pipeline-may-never-restart>.

¹⁶ RL Miller, *Keystone pipeline spilled tar-sands oil 11 times in past year. Do we really want to supersize it?*, Grist.org, May 12, 2011, available at <http://www.grist.org/oil/2011-05-12-lets-supersize-a-disaster> last accessed May 2011.

¹⁷ Edward Welsch, *TransCanada Pipeline Spills Oil in North Dakota*, Wall St. J., May 9, 2011, available at <http://online.wsj.com/article/SB10001424052748703730804576313432899153672.html> last accessed May 2011; <http://www.argusleader.com/assets/pdf/DF174518518.PDF>.

¹⁸ State Department, Supplemental Draft Environmental Impact Statement, 3-93, 2011, <http://www.keystonepipeline-xl.state.gov/clientsite/keystonex1.nsf?Open>.

environment.”¹⁹ The Keystone pipeline is the newest hazardous liquid pipeline to ever receive such an enforcement action.²⁰ These failures provide early signs that minimum design requirements for conventional pipelines may not be sufficient for the Keystone system. (see Attachment 3: NRDC et. al. Comments to the Office of Pipeline Safety In response to the Advanced Notice of Proposed Rulemaking Titled “Safety of On-Shore Hazardous Liquid Pipelines”)

Limits of leak detection technology

Pipeline leak detection technology continues to have significant limits when it comes both to real-time leak detection and detection of “small” persistent leaks. Past experience with spills on the Keystone and other diluted bitumen lines demonstrate that operator detection and response are often the most significant component dictating total overall time before pipeline shutdown.²¹ During the Kalamazoo spill in Michigan, the pipeline involved wasn’t finally shut down until twelve hours after the leak first occurred.²² An investigation of Keystone I’s May 7 spill by North Dakota authorities showed that while the leak detection system indicated a spill had occurred at 3:51 AM, the pipeline was not shut down until 4:35 AM – a response time of

¹⁹ Department of Transportation, Corrective Action Order, June 3, 2011, http://blog.nwf.org/wildlife/promise/files/2011/06/320115006H_CAO_06032011.pdf.

²⁰ A review of all CAO’s on record issued by PHMSA for hazardous liquid pipelines, available at: PHMSA, Enforcement Action Database, 1985-2011, <http://www.phmsa.dot.gov/pipeline/enforcement>.

²¹ NRDC Pipeline Study.

²² Deborah Hersman, Chairman of the National Transportation Safety Board, Testimony before Committee on Transportation and Infrastructure, September 15, 2010, <http://www.nts.gov/speeches/hersman/daph100915.html> (last accessed January 12, 2011). See also: Matthew McClearn, “Enbridge: Under Pressure,” *Canadian Business*, December 6, 2010, http://www.canadianbusiness.com/markets/commodities/article.jsp?content=20101206_10023_10023 (last accessed January 12, 2011). See also: Eartha Jane Melzer, “Pipeline spill underlies fears of new tar sands development,” *Michigan Messenger*, August 10, 2010, <http://michiganmessenger.com/40744/pipeline-spill-underlines-fears-of-new-tar-sandsdevelopment>

forty-four minutes.²³ This was after a third party called to provide visual confirmation of the spill as operators were validating leak detection data.²⁴

However, in many ways most concerning is the challenge that the detection of small, persistent leaks pose to detection systems. This problem is demonstrated by a recent 63,000 gallon spill on an Enbridge pipeline in Canada.²⁵ That spill was the result of a leak the size of a pinhole that went undetected by the company and was eventually discovered by nearby residents.²⁶ Undiscovered seeping leaks can dramatically increase the impacts of what would otherwise be small spills.

Meanwhile, computational pipeline monitoring (CPM) systems used to detect pipeline leaks are only able to detect leaks that comprise a certain percentage of overall pipeline capacity. This presents potential problems for all pipelines. On high-capacity pipelines like Keystone XL, which would carry 830,000 bpd, the inability to detect a leak below 1.5% – 2% of overall flow rate could lead to disaster, leading to an undetected “seep” as large as 16,600 barrels (or nearly 700,000 gallons) per day.²⁷ The reality of these risks, and the limits of current leak detection technology, must be understood when siting pipelines.

Diluted bitumen spills present new risks to the public and environment

In addition to the increased risk of pipeline spills, diluted bitumen spills themselves pose new challenges and hazards to the public and environment. By itself, bitumen is far too thick, or viscous, to move through a pipeline, even at high pressure. Natural gas liquid condensate, the

²³ North Dakota Public Service Commission, Summary of Keystone Release Incident, May 16, 2011, <http://www.argusleader.com/assets/pdf/DF174518518.PDF>.

²⁴ *Id.*

²⁵ *No coverup in N.W.T. pipeline leak: Enbridge*, CBC News Canada, June 7, 2011, <http://www.cbc.ca/news/canada/north/story/2011/06/07/nwt-enbridge-pipeline-spill.html>.

²⁶ *Id.*

²⁷ State Department, SDEIS for Keystone XL, 3-127, 2011.

substance often used to dilute bitumen to allow it to travel through a pipe, is primarily composed of smaller, volatile hydrocarbons. These include small aromatic hydrocarbons such as benzene and small paraffinic and naphthenic hydrocarbons like pentane and hexane.²⁸

While conventional crude has relatively small concentrations of light, volatile hydrocarbons, these smaller hydrocarbons may make up as much as 30% of diluted bitumen.²⁹ The low flash point and high vapor pressure of the natural gas liquid condensate used to dilute the bitumen increase the risk of a leak exploding with catastrophic results.³⁰ Some blends of diluted bitumen contain more than nine percent pentane content.³¹ Pentane is an extremely flammable natural gas liquid that has been known to ignite from static discharge, even under carefully controlled and monitored conditions.³² Pentane vapor adversely affects the central nervous system when inhaled, and pentane liquid readily evaporates at room temperature, absorbing latent heat from the environment.³³ As a senior process engineer working on tar sands diluted bitumen issues noted:

“The safety risks associated with solvent release are high. On the basis of the likelihood and consequences, the risk rating matrix could rank a solvent release as high as 1 or 2 [extremely high or high risk] if a paraffinic hydrocarbon is used.”³⁴

²⁸ El Paso Corporation, Material Safety Data Sheet for NGL Condensate, 2007, <http://www.elpaso.com/msds/A0021-Natural%20Gas%20Condensates.pdf>.

²⁹ IHS CERA, Oil Sands, GHGs, and European Oil Supply, March 2010, Pg. 19, http://www.ceps.eu/system/files/article/2011/03/MARCH%2021_Final_JACKIE%20FORREST.pdf

³⁰ There are numerous cases of pipeline explosions involving NGL condensate, including the January 1, 2011 explosion of a NGL condensate line in northern Alberta (“Pengrowth investigates pipeline explosion in northern Alberta,” *The Globe and Mail*, 2 Jan. 2011, <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/pengrowth-investigates-pipeline-explosion-in-northern-alberta/article1855533/>, last accessed 12 Jan. 2011); and the 2007 explosion of an NGL pipeline near Fort Worth Texas after it had been ruptured by a third party (“No Injuries In Parker Co. Gas Pipeline Explosion,” *AP/CBS 11 News*, 12 May 2007, http://www.keiberginc.com/web_news_files/pipeline-explosion-pr1.pdf, last accessed 12 Jan. 2011).

³¹ Crude Monitor, Access Western Blend, 2011, <http://www.crudemonitor.ca/crude.php?acr=AWB>.

³² Vining Wolff, Solvent Slurries in Bitumen Production, Knovel Engineering Cases, March 18th, 2011, <http://engineeringcases.knovelblogs.com/2011/03/18/solvent-slurries-in-bitumen-production/>.

³³ *Id.*

³⁴ *Id.*

Diluted bitumen contains benzene, polycyclic aromatic hydrocarbons, and n-hexane, toxins that can affect the human central nervous systems.³⁵ As the Environmental Protection Agency noted, following the Kalamazoo diluted bitumen spill in Michigan, high benzene levels in the air prompted the issuance of voluntary evacuation notices to residents in the area by the local county health department.³⁶ A report filed by the Michigan Department of Community Health found that nearly 60 percent of individuals living in the vicinity of the Kalamazoo spill experienced respiratory, gastrointestinal, and neurological symptoms consistent with acute exposure to benzene and other petroleum related chemicals.³⁷ In addition to their short term effects, long term exposure to benzene and polycyclic aromatic hydrocarbons has been known to cause cancer.³⁸

In addition to its volatile components, diluted bitumen also contains vanadium, nickel, arsenic and other heavy metals in significantly larger quantities than occur in conventional crude.³⁹ These heavy metals have a variety of toxic effects, are not biodegradable, and can accumulate in the environment to become health hazards to wildlife and to people.⁴⁰

³⁵ "Material Safety Data Sheet: DilBit Cold Lake Blend," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2479752, last accessed 12 Jan. 2011.

³⁶ Environmental Protection Agency, Comments regarding SDEIS for Keystone XL project, June 6, 2011 <http://www.epa.gov/compliance/nepa/keystone-xl-project-epa-comment-letter-20110125.pdf>.

³⁷ Martha Stanbury et al., *Acute Health Effects of the Enbridge Oil Spill*, Lansing, MI: Michigan Department of Community Health, November 2010, http://www.michigan.gov/documents/mdch/enbridge_oil_spill_epi_report_with_cover_11_22_10_339101_7.pdf, last accessed 12 Jan. 2011.

³⁸ *Toxicological Profile for Polycyclic Aromatic Hydrocarbons*, Agency for Toxic Substances and Disease Registry, 1995, <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=122&tid=25>, last accessed 12 Jan. 2011.

Benzene, Agency for Toxic Substances and Disease Registry, 1995, <http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=14>, last accessed 12 Jan. 2011.

³⁹ "Athabasca Bitumen," Environment Canada, Emergencies Science and Technology Division, http://www.etc-cte.gc.ca/databases/OilProperties/pdf/WEB_Athabasca_Bitumen.pdf.

"Tar Sands," South Dakota Sierra Club, <http://southdakota.sierraclub.org/LivingRiver/tarsands.htm>.

⁴⁰ The bioaccumulation of heavy metals is well established in academic literature (see, for example, R. Vinodhini and M. Narayanan, *Bioaccumulation of heavy metals in organs of fresh water fish Cyprinus carpio (Common carp)*, Int. J. Environ. Sci. Tech, 5 (2), Spring 2008, 179-182, <http://www.ceers.org/ijest/issues/full/v5/n2/502005.pdf>, last accessed 12 Jan. 2011). Heavy metals are elemental in nature and cannot biodegrade and have a variety of toxic

Diluted Bitumen presents new challenges for spill response and cleanup

The characteristics of diluted bitumen also create significant new challenges for cleanup efforts. In the case of conventional oil spills, mechanical devices such as booms, skimmers, and sorbent materials, the primary line of defense against oil spills in the United States,⁴¹ contain and recover oil floating on the water surface.⁴² However, unlike conventional crude oils the majority of diluted bitumen is composed of raw bitumen which is heavier than water. Following a release, the heavier fractions of diluted bitumen will sink into the water column and wetland sediments. In these cases, the cleanup of a diluted bitumen spill may require significantly more dredging than a conventional oil spill.⁴³ Eleven months have passed since the Enbridge spill in the Kalamazoo river watershed, and the Kalamazoo River is still closed. Spill responders attribute the difficulties of cleanup to the blend of crude spilled—a combination of Cold Lake diluted bitumen and Western Canadian Select diluted bitumen. Mark Durno, Deputy Incident Commander with EPA, recently stated:

“I truly believe the characteristics of this material is the reason we still have such a heavy operation out here. Because it was a very heavy crude, we ended up with a lot more submerged oil than we anticipated having to deal with.”⁴⁴

effects (“Toxicological Profiles,” Agency for Toxic Substances and Disease Registry, 2010, <http://www.atsdr.cdc.gov/toxprofiles/index.asp>, last accessed 12 Jan. 2011).

⁴¹ “Oil Spill Response Techniques,” EPA Emergency Management, Environmental Protection Agency, 2009, <http://www.epa.gov/oem/content/learning/oiltech.htm>.

⁴² *Understanding Oil Spills and Oil Spill Response*, Environmental Protection Agency, 2009, Chapter 2: Mechanical Containment and Recovery of Oil Following a Spill, http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap2.pdf, last accessed 12 Jan. 2011.

⁴³ *The Northern Great Plains at Risk: Oil Spill Planning Deficiencies in Keystone Pipeline System*, Plains Justice, 2010, p. 7, http://plainsjustice.org/files/Keystone_XL/Keystone%20Pipeline%20Oil%20Spill%20Response%20Planning%20Report%202010-11-23%20FINAL.pdf.

⁴⁴ Rebecca Williams, *Oil Lingers in Kalamazoo River*, The Environment Report, Radio Interview, Apr 4, 2011, <http://www.environmentreport.org/show.php?showID=520>.

Further, heavy oil exposed to sunlight tends to form a dense, sticky substance that is difficult to remove from rock and sediments.⁴⁵ It would be tempting to call this material “tar”, but commercial tar does not contain the corrosive sulfur chemicals or toxic heavy metals characteristic of Canadian bitumen. Removing this tarry substance from river sediment and shores requires more expensive and time-consuming cleanup operations than required by conventional oil spills.⁴⁶ These factors increase both the economic and environmental costs of diluted bitumen spills.

These are just early signs of trouble. They do not eliminate the need for additional study; rather, they present an urgent and compelling case that more study is needed. As the United States transports increasing volumes of this more toxic heavy crude through its onshore pipeline system, it is imperative these risks are properly understood and addressed. The environmental assessment for Keystone XL should be informed by a clear understanding of the real risks of this pipeline so that appropriate alternatives may be considered. Beginning with a default assumption that proposed Keystone XL will be safe undermines the National Environmental Policy Act (NEPA) review process.

Regulators cannot use risk-based standards to effectively ensure the safe, reliable, and environmentally sound operation of the nation’s pipeline system until they have apprised themselves of the nature or magnitude of risks from transporting an increasing amount of diluted bitumen through U.S. pipelines. This is an area that requires proactive due diligence. It is imprudent to adopt a reactive wait-and-see approach toward these risks.

⁴⁵ *Understanding Oil Spills and Oil Spill Response*, Environmental Protection Agency, 2009, Chapter 4: Shoreline Cleanup of Oil Spills, http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap4.pdf.

⁴⁶ *Id.*

Government oversight and regulation can prevent serious oil pipeline leaks and spills

Addressing diluted bitumen pipeline safety risks may require a variety of changes in the design, operation and corrosion control practices for these pipelines. Such changes cannot be left to the good will of the oil pipeline industry. Actions which Congress may take to address some of the safety risks posed by corrosive products such as diluted bitumen include:

- 1. Congress should require that PHMSA conduct a detailed study of pipeline transport of tar sands*

Rather than ignoring the problem and blindly presiding over an unprecedented expansion of pipeline infrastructure intended to transport diluted bitumen over sensitive resources, Congress should direct our pipeline safety regulators to fully study the risks and develop the appropriate regulations to address them. Fortunately, the Senate is advancing S.275, “The Pipeline Transportation Safety Improvement Act of 2011,” a bill which directs PHMSA to conduct an analysis of whether there is an increased spill risk for pipelines transporting tar sands crude oil and if current pipeline safety regulations are sufficient to address that risk. This is a necessary first step in the right direction. We urge the House to support this measure.

Additional steps are also necessary. A thorough understanding of the impacts tar sands diluted bitumen has on pipeline integrity only provides PHMSA with half of the information it needs to effectively use risk-based standards to ensure the safety of tar sands pipelines. The agency must also have a thorough understanding of the potential impacts of a diluted bitumen spill. Risk-based spill standards must not only consider the frequency of a spill risk, but also the nature and severity of that risk. Diluted bitumen includes concentrations of volatile, highly flammable natural gas liquids transported at high pressure and temperature. The potential for

large-scale explosion and conflagration is both real and substantial. Furthermore, cleanup of diluted bitumen presents responders with unique challenges. Congress should direct the Environmental Protection Agency to work with PHMSA to develop coordinated cleanup responses specifically targeted to this relatively new environmental risk.

2. Congress should direct PHMSA to engage in all stages of pipeline development

PHMSA should be actively engaged in all stages of major pipeline infrastructure development, including the environmental review process, project design, construction and operation. While PHMSA does not have siting authority for hazardous liquid pipeline, the agency cannot effectively establish risk-based safety standards unless it is appraised of the public and environmental resources at risk and the magnitude of that risk.

The U.S. State Department is currently considering an application for a Presidential Permit by TransCanada for a pipeline project called Keystone XL. That project is currently undergoing an environmental review as part of the National Environmental Policy Act (NEPA). PHMSA does not appear to be actively engaged in the environmental risks assessment for Keystone XL. It should be. As it stands, in their latest environmental review of Keystone XL, the Department of State's pipeline experts have determined that the Keystone XL pipeline will have a leak due to pipeline corrosion once every 3,400 years and a leak due to flooding and washout once every 87,600 years. State's prediction that the proposed Keystone XL pipeline will have a leak due to "Materials and Construction" once every 3,300 years is even more surprising, given that the first Keystone pipeline, built by the same company, using the same grade steel that would be used to build Keystone XL, has had a dozen leaks in less than a year of operation. Of course, few people expect the Department of State to have significant pipeline safety expertise.

PHMSA does and should be using their expertise to support the federal NEPA process for Keystone XL. This should include the development of a report addressing pipeline safety issues specific to diluted bitumen, prior to the completion of the NEPA review process.

You simply cannot have an agency that purports to use risk-based standards to regulate pipeline safety take a hands-off approach when it comes to where a pipeline is built, what happens if it spills, and how those two dynamic variables affect each other. PHMSA should be actively engaged at all levels of the pipeline project planning, design, and construction process. This should include a report establishing pipeline safety guidelines and regulations specific to diluted bitumen. That report should inform the environmental impact statement process for Keystone XL and the routing of the pipeline.

3. Congress should direct PHMSA to provide additional protections for open-source Aquifers

The Ogallala Aquifer is a prime example of an absolutely essential water resource that should receive the highest level of protection under pipeline safety regulations. The Ogallala Aquifer, considered one of the great fresh water resources of the world, contains approximately two-thirds of the volume of the High Plains Aquifer system. It covers approximately 174,000 square miles underneath eight states.⁴⁷ It is one of the largest fresh water aquifer systems in the world. The Ogallala Aquifer is a vital water source for irrigating U.S. farmland. However, the aquifer is very porous. A pipeline spill here would likely have substantial impacts, potentially causing long-term damage that would be extremely difficult to contain and remediate.

Given the importance and sensitivity of this resource, one would assume that PHMSA's risk based standards would afford it the highest level of protection. This is not the case. In fact,

⁴⁷ United States Geological Service, High Plains Regional Groundwater Survey, June 14, 2011, <http://co.water.usgs.gov/hawqa/hpgw/factsheets/DENNEHYFS1.html>

the Ogallala Aquifer receives the lowest level of federal oversight under current pipeline safety regulations. This is a potential disaster waiting to happen. Current plans are to construct the Keystone XL tar sand pipeline through the heart of the Ogallala Aquifer in an area in Nebraska called the Sandhills. With over a billion acre-feet of groundwater,⁴⁸ this is the richest area of Ogallala Aquifer. In many parts of the Sandhills, the water table is at surface level. We really don't know how a spill will impact the Sandhills region or what challenges attempting to remediate contamination in the Aquifer here will entail. PHMSA's records show that there are currently no crude oil pipelines going through Nebraska's Sandhills.⁴⁹ TransCanada, which wants to build a pipeline through that environmentally sensitive region, has not presented a special plan in the event of a worst case scenario, possibly because the company "anticipate(s) that most spills will be small and easily removed with a shovel,"⁵⁰ During the Gulf spill, we witnessed the sad consequences that come of allowing an accident prone company to replace expensive but prudent safety measures with reckless optimism. Let us not court a similar disaster in the deep waters of our nation's greatest fresh water aquifer.

Conclusion

It is in the public's best interest for our pipeline safety regulators to evaluate the risks that high volumes of heavy, corrosive and abrasive crudes, such as diluted bitumen, will have on the U.S. pipeline system. After PHMSA has identified these risks, the agency should adopt appropriate safety regulation. Both should be done before significant new pipeline projects, such

⁴⁸U.S. Fish and Wildlife Service, *The Sandhills: Building Partnerships for an Ecosystem*, <http://www.fws.gov/mountain-prairie/pfw/ne/ne4.htm#Whatis>.

⁴⁹ Review of hazardous liquid pipelines in NE Sandhills counties (National Pipeline Mapping System, <http://www.npms.phmsa.dot.gov/PublicViewer/>, last visited June 10, 2011).

⁵⁰ State Department, Supplemental Draft Environmental Impact Statement, Appendix C "Spill, Countermeasure and Prevention" Adobe pg. 15. <http://www.keystonepipeline-xl.state.gov/clientsite/keystonexl.nsf?Open>.

as the proposed Keystone XL pipeline, are permitted and constructed. We hope that you will closely consider the concerns that we have raised today and act to ensure the future safety of our hazardous liquid pipeline system. It would be tragic to wait until the United States has a catastrophic diluted bitumen spill to take these risks seriously.

NRDC thanks you for the opportunity to present its views. As the nation continues to strive towards greater standards of pipeline safety, we look forward to working with the Committee to develop policies that foster a balanced and environmentally sustainable outcome.



NATURAL RESOURCES DEFENSE COUNCIL

March 24, 2011

Jeffrey D. Wiese
 Associate Administrator for Pipeline Safety
 U.S. Department of Transportation
 1200 New Jersey Avenue, S.E.
 Washington, DC 20590-0001

Dear Mr. Wiese,

Pipeline safety is of major concern right now – in the Congress and in communities around pipelines. The Enbridge pipeline tar sands oil spill into the Kalamazoo River in Michigan highlighted a need for caution in the permitting and operation of new and existing pipeline that carry tar sands oil – especially with an anticipated growth in the amount of diluted bitumen that U.S. pipeline will be transporting in the coming years. We ask that the Pipeline Hazardous Materials and Safety Administration (PHMSA) ask the State Department to wait for a detailed and comprehensive PHMSA analysis of pipeline safety as it regards diluted bitumen pipelines prior to releasing the draft supplemental environmental impact statement (SEIS) of the proposed Keystone XL pipeline project for public review. The State Department has said that it will release the draft SEIS for the Keystone XL project in mid-April. This is clearly not enough time for PHMSA to prepare the type of detailed analysis of the pipeline safety issues of diluted bitumen that are required for the Keystone XL SEIS.

As you are aware, on February 16, 2011, the Natural Resources Defense Council, together with the Pipeline Safety Trust, the National Wildlife Federation and the Sierra Club, released the report *Tar Sands Pipeline Safety Risks*. The report highlights the corrosive, unstable characteristics of diluted bitumen, an increasingly common product on the U.S. hazardous liquid pipeline system. Following the report's release, the Energy Resources Conservation Board (ERCB), a quasi-government agency supported by the Government of Alberta and the oil and gas industry, responded in a manner that was potentially misleading. In order to help provide an objective evaluation and analysis of the risks that diluted bitumen may pose to pipelines, we address ERCB and other comments on the pipeline safety issues of diluted bitumen here in more technical detail than in the report.

There are many indications that the characteristics of diluted bitumen pose increased risks to pipeline systems. Diluted bitumen has not been transported through large pipelines in Alberta or the United States for enough time to have case studies establishing its long term effect on pipeline systems. However, chemical assays of diluted bitumen blends, reports from refiners receiving diluted bitumen, large spills in the United States involving diluted bitumen or pipelines

that carry it as part of their product mix, and the safety record of the Alberta pipeline system all raise questions that need to be addressed as an increasing amount of diluted bitumen is coming through U.S. pipelines.

These warning signs merit serious consideration and due diligence by PHMSA's Office of Pipeline Safety (OPS). We hope that OPS will consider these risks and evaluate effective safety measures to mitigate them. If new design requirements are necessary to address the risks of diluted bitumen pipelines, it would be in the public's interest to establish those requirements before significant new diluted bitumen pipeline projects, such as the proposed Keystone XL pipeline, are constructed. It would be tragic to wait until the United States has a well established record of diluted bitumen pipeline spills to take these risks seriously and adopt appropriate safety regulations.

I. Diluted bitumen has corrosive characteristics

The report *Tar Sands Pipeline Safety Risks*¹ outlines some of the characteristics of diluted bitumen which may render it a greater threat to pipeline systems than conventional crude. These characteristics include diluted bitumen's high total acid number (TAN); high viscosity; high sulfur concentrations; high bottom, water and sediment (BW&S) loads; the presence of quartz in diluted bitumen sediment; the presence of chlorine salts; the instability of a mixture of heavy raw bitumen and light natural gas liquids; and high temperature and pressures at which these pipelines operate. The ERCB responded by erroneously claiming that the sulfur was removed from diluted bitumen during processing and asserting that because the API gravity of diluted bitumen was similar to heavy crude and that it "resembled conventional crude products."² It then ignored the other characteristics of diluted bitumen, many of which have synergistic corrosive effects.³ As the Crude Oil Quality Group correctly noted in a presentation to the Canadian Crude Oil Quality Association (COQA), "the commonly used industry standards of gravity and sulfur, while important, do not adequately define a crude oil."⁴

A. Sediment content in diluted bitumen presents risks of pipeline abrasion

Raw bitumen contains heavy fractions which accumulate salt, solids, metals and asphaltenes.⁵ The National Centre for Upgrading Technology (NCUT) states that "on average, a refinery processing 100Kbbs/day of crude [diluted bitumen] receives over 5 tons/day of salts and solids."⁶ NCUT also notes that pipeline sediment and water specs provide significant room to increase the

¹ NRDC, et. al., "Tar Sands Pipeline Safety Risks," Feb. 2011, <http://www.nrdc.org/energy/tarsandssafetyrisks.asp>.

² ERCB, "ERCB Addresses Statements in Natural Resources Defense Council Pipeline Safety Report," Feb. 16, 2011, http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_304_264_0_43/http%3B/ercbContent/publishedcontent/publish/ercb_home/news/news_releases/2011/nr2011_04.aspx.

³ Id.

⁴ Crude Oil Quality Group, "Crude Oil Quality," Presentation to the Crude Oil Quality Association, 2002, pg. 5, <http://www.coqa-inc.org/PIPELINE%2002-10-05.pdf>.

⁵ National Centre for Upgrading Technology, "Oilsands Bitumen Processability Project," March 2006, pg. 2, <http://www.coqa-inc.org/20060223NCUT.pdf>.

⁶ Id., pg. 5.

solids content of diluted bitumen, presumably relative to conventional blends.⁷ The 0.5% minimum bottom, sediment and water measures allowed by pipeline operators represent 500 ppm or 153,000 pounds per day of solids for a 900,000 barrel per day pipeline like Keystone XL.⁸ U.S. refiners are reporting higher quantities of both filterable and unfilterable solids in bitumen derived crudes.⁹ It is not simply the quantity of solid content in diluted bitumen that presents a risk of pipeline abrasion; it is also the hardness of that sediment. In a presentation to the Canadian COQA, Nalco Energy Services presented an analysis of filter deposits at U.S. refiners that found twenty-five percent of diluted bitumen sediment was composed of quartz, alibite, and pyrite.¹⁰ These minerals have a Moh's mineral hardness rating between six and seven.¹¹ At high pressures, these materials can pose a risk of abrasive wear to the pipeline over time. The combination of large sediment loads, containing materials of greater hardness than carbon steel, moving through carbon steel pipelines at high pressure, creates risks to pipeline integrity that should be fully evaluated and effectively mitigated.

B. Diluted bitumen contains significantly higher concentrations of sulfur

The ERCB claims that sulfur is removed during conventional tar sands processing.¹² While the term "conventional tar sands processing" is somewhat ambiguous, the ERCB may be referring to the conventional process of using field upgraders to convert bitumen to synthetic crude oil. If this is the case, it entirely misses the point; the safety issues detailed in *Tar Sands Pipeline Safety* were those associated with diluted bitumen, not synthetic crude. There is simply no question of fact when it comes to the high sulfur content of diluted bitumen imports from Alberta. The Canadian Crude Quality Monitor reports significantly higher sulfur contents of 2.5% to 4.5% in diluted bitumen blends.¹³

High sulfur content can increase the risk of hydrogen stress corrosion cracking in crude oil pipelines.¹⁴ The National Association of Corrosion Engineers (NACE) classifies this type of stress corrosion cracking as a catastrophic form of corrosion, as it is very difficult to detect the

⁷ *Id.*, pg. 5.

⁸ The 0.5% solid limit allows 17,000 pounds per day of salts and solids for a refiner processing 100,000 bpd of diluted bitumen. *Id.*, pg. 5. A 900,000 bpd diluted bitumen pipeline would be permitted to carry nine times this amount, or up to 153,000 lbs per day.

⁹ 2008 NPRA Q&A and Technology Forum: Answer Book, Champion's Gate, FL: National Petrochemical and Refiners Association, 2008, Question 50: Desalting, http://www.npra.org/forms/uploadFiles/17C4900000055.filename.2008_QA_Answer_Book.pdf.

¹⁰ S.A. Lordo, "New Desalting Chemistry for Heavy/High Solids Crude," 2010, pg. 12, http://coqa-inc.org/20100211_Lordo_Solids_in_Crude.pdf.

¹¹ Quartz and Alibite have Moh's hardness of 7, pyrite has a Moh's hardness of 6.5. 7, Mineralogy Database, Alibite, Quartz, and Pyrite Mineral Data, <http://webmineral.com>.

¹² ERCB, "ERCB Addresses Statements in Natural Resources Defense Council Pipeline Safety Report," Feb. 16, 2011,

http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_304_264_0_43/http%3B/ercbContent/publishedcontent/publish/ercb_home/news/news_releases/2011/nr2011_04.aspx.

¹³ Crude Oil Quality Association, *Canadian Crude Quick Reference Guide Version 0.54*, 2009, <http://www.coqa-inc.org/102209CanadianCrudeReferenceGuide.pdf>.

¹⁴ Russell Jones, "Stress-Corrosion Cracking – Materials Performance and Evaluation," 1992, pg. 46.

fine cracks that form in pipeline materials and damage is not easily predicted.¹⁵ Stress corrosion cracking may result in an unexpected, disastrous failure with minimal material loss to provide advance warning of its onset and¹⁶ is a greater risk for high strength steels.¹⁷ This poses a potentially serious risk as diluted bitumen pipeline operators such as TransCanada using thin pipeline wall designs and high strength steel to satisfy U.S. pipeline requirements.¹⁸

C. Blending raw bitumen with natural gas liquids does not create a product resembling conventional crude

ERCB claimed that when natural gas liquid condensate is blended with heavy bitumen it becomes a thinned bitumen that “more closely resembles conventional crude products.”¹⁹ There is little evidence to support this statement. Blending the heaviest hydrocarbons with some of the lightest hydrocarbons will result in a mixture that, on average, has the same density as a heavy conventional crude blend. However, as the Canadian Crude Oil Quality Group noted, density is not the only important characteristic of crude oil.²⁰ In this case, the mixture of a heavy and light molecule does not behave in the same way that two medium sized molecules do.

The pipeline company Enbridge noted the problems associated with blending raw bitumen with lighter fractions of natural gas liquids in a presentation to the Canadian Crude Quality Technical Association.²¹ The problems Enbridge noted with blending crude with butane included accelerated corrosion in tankage and accelerate wear due to cavitation.²² Increased vapor pressure due to very light hydrocarbons can cause cavitation at points of pipeline pressure reduction.²³ As data from the Canadian Crude Quality Monitoring Program shows, Western Canadian Select (WCS) blend diluted bitumen is composed of 2.2% butane (C_4H_{10}), 4% pentane (C_5H_{12}) and 3.6% hexane (C_6H_{14}).²⁴ While mixing natural gas liquid condensate with raw bitumen will alter the average density of the blend, it will not change the boiling points of its constituent fractions.

In addition, while mixing raw bitumen with natural gas liquids lowers its viscosity, it must be remembered that unblended raw bitumen begins as a semi-solid substance with a viscosity of

¹⁵ National Association of Corrosion Engineers, “Resource Center – Corrosion Forms, Stress Corrosion Cracking,” <http://events.nace.org/library/corrosion/Forms/scc.asp>.

¹⁶ *Id.*

¹⁷ Russell Jones, *Stress-Corrosion Cracking – Materials Performance and Evaluation*, 1992, pg. 46.

¹⁸ Keystone XL will be constructed of high strength X-70 and X-80 steel, Entrix, “Keystone XL Project Environmental Report, Supplemental Filing,” July 6, 2009, Chapter 1, 1-8, http://www.entrix.com/keystone/XL/76/Chapter_1.pdf

¹⁹ ERCB, “ERCB Addresses Statements in Natural Resources Defense Council Pipeline Safety Report,” Feb. 16, 2011, http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_304_264_0_43/http%3B/ercbContent/publishedcont.

²⁰ Crude Oil Quality Group, “Crude Oil Quality,” Presentation to the Crude Oil Quality Association, 2002, pg. 5, <http://www.coqa-inc.org/PIPELINE%2002-10-05.pdf>.

²¹ Enbridge, “Concerns relating to butane/crude blending,” Presentation to the Canadian Crude Quality Technical Association, 2000, pg. 1, <http://www.ccqta.com/presentation/Concerns%20on%20Butane-Crude%20Blending%20-%20Nov%202000.pdf>.

²² *Id.*, pg. 6.

²³ *Id.*, pg. 6.

²⁴ Crude Monitor, “Western Canadian Select (WCS),” visited on March 20, 2011, <http://www.crudemonitor.ca/crude.php?acr=WCS>.

235,000 centistokes (cST) at 15 degrees Celsius.²⁵ Diluted bitumen blends have viscosities ranging from 175 CST – 350 CST (the maximum allowable under current tariffs). This is significantly higher than the North American benchmark crude, West Texas Intermediate, East Texas blend, Alaskan North Slope, Dubai Export, Arabian Heavy Crude.

Table 1. Viscosities of a range of crude products²⁶

Blend	Viscosity (cST at 20° C)
West Texas Intermediate	4.92
East Texas	5.18
Alaska North Slope	11.0
Dubai Export	13.7
Arabian Heavy Crude	44.33
Cold Lake Diluted Bitumen	177.48

High viscosity crudes create more friction as they travel through pipelines, which increase pipeline temperature.²⁷ In addition, viscous crudes also tend to generate false alarms for leak detection systems.²⁸

D. High pipeline temperature increases the speed of corrosive chemical interactions

As noted above, the high viscosity of diluted bitumen generates high friction in pipelines,²⁹ which in turn generates heat.³⁰ A pipeline study commissioned by the California State Fire Marshall, found that pipeline operating temperature had a statistically significant effect on leak incident rates.³¹ This is consistent with the industry rule of thumb that the rate of corrosion doubles with every twenty degrees Fahrenheit increase in temperature.³² Diluted bitumen pipeline operators do not need to employ special means to heat their viscous product. At

²⁵ Environment Science & Technology Centre, Government of Canada, Oil Properties Database - Cold Lake Bitumen, http://www.etc-cte.gc.ca/databases/OilProperties/pdf/WEB_Cold_Lake_Bitumen.pdf.

²⁶ Energy Institute, Data pages for West Texas Intermediate, East Texas, Alaska North Slope, Dubai Export, Arabian Heavy Crude, Cold Lake Diluted Bitumen, visited March 20, 2011, http://www.oil-transport.info/Crude_oil_data/crude_oil_data.html.

²⁷ Pipelines are heated by friction as high pressure is applied to viscous oil. Slusarchuk, W.A., "Hot Pipeline in Permafrost: Hydraulic, Thermal and Structural Considerations," 1972, pg. 2, <http://www.nrc-cnrc.gc.ca/obj/irc/doc/pubs/ir394/ir394.pdf>. Friction increases with viscosity. *Id.*, pg. 3.

²⁸ Melzer, Eartha, "Pipeline spill underlines fears of new tar sands development," Michigan Messenger, 8/10/2010, <http://michiganmessenger.com/40744/pipeline-spill-underlines-fears-of-new-tar-sands-development>.

²⁹ Mandil, Claude, "Environmental and Technological Issues Associated with Non-Conventional Oil," 2002, pg. 3, <http://www.iea.org/work/2002/calgary/Mandil.pdf>.

³⁰ G.V. Chilingarian et. al., Surface operations in petroleum production, part 1, 1987, pg. 237.

³¹ California Office of the State Fire Marshal, "An Assessment of Low Pressure Crude Oil Pipelines and Crude Oil Gathering Lines in California," April 1997, pg. 53, <http://osfm.fire.ca.gov/pipeline/pdf/publication/lowstresspipeline.pdf>.

³² See, CIRIA, Chemical Storage Tank Systems – Good Practices, p. 204.

pressures above 1000 pounds per square inch and viscosity up to 350 centistokes,³³ diluted bitumen creates substantial friction which generates heat, raising pipeline temperatures.³⁴

Higher pipeline temperature, regardless of its cause, increases the rate of corrosive chemical interactions. Thus, a high temperature pipeline carrying a particularly corrosive product presents a greater risk than a high temperature pipelines carrying less corrosive product. High operating temperature also increase the risk that external corrosion measures, such as fusion bonded epoxy coatings, will deteriorate over time.³⁵

E. Crudes very similar to diluted bitumen are generally not transported on the U.S. onshore pipeline system

Pipeline operators have also suggested that the safety of diluted bitumen pipelines is established by the existence of certain heavy crude blends which share some of the corrosive characteristics of diluted bitumen. This requires an erroneous assumption. It is true that U.S. refiners are processing increasingly heavy blends of crude³⁶ and some of these blends have high sulfur, viscosity and acid content. However, these blends are generally not found in the U.S. onshore pipeline system.

There are a number of heavy crude blends that travel by tanker to U.S. gulf coast refineries. These include blends of Venezuelan heavy crude, Mexican Maya³⁷ and Arabian Heavy.³⁸ While the degree to which these crudes are similar to diluted bitumen is a subject for debate, the fact that these crudes have a very limited presence on the U.S. onshore pipeline system is not.

California produces Bakersfield heavy crude blend in its Kern county fields. In 2010, these fields produced approximately 292,000 bpd of heavy oil³⁹ with relatively high sulfur and TAN values.⁴⁰ However, this heavy oil these fields all are in very close proximity to significant

³³ Pipeline operator tariffs require that product not exceed 350 cST viscosity, Enbridge, Crude Petroleum Tariff, March, 2008, pg. 3, <http://www.enbridge.com/DeliveringEnergy/Shippers/~media/Site%20Documents/Delivering%20Energy/Shippers/epi-neb-tariff-282.ashx>

³⁴ Pipelines are heated by friction as high pressure is applied to viscous oil. Slusarchuk, W.A., "Hot Pipeline in Permafrost: Hydraulic, Thermal and Structural Considerations," 1972, pg. 2, <http://www.nrc-cnrc.gc.ca/obj/irc/doc/pubs/ir/ir394/ir394.pdf>. Friction increases with viscosity. *Id.*, pg. 3

³⁵ Norswothy, Richad, "Fusion Bonded Epoxy – a field proven fail safe coating system," Corrosion, March 12-16, 2006, <http://www.onepetro.org/mslib/servlet/onepetropreview?id=NACE-06044&soc=NACE&>

³⁶ Average API gravity inputs to refiners have steadily declined from 32.64 in Jan. 1985 to 30.71 in Dec. 2010. U.S. Energy Information Administration, Petroleum & Other Liquids, 2/25/2011, <http://www.eia.doe.gov/dnav/pet/hist/LeafHandler.ashx?n=pets&s=mcrapus2&f=m>.

³⁷ Mexico does not have any international pipeline connections, with most exports leaving the country via tanker from three export terminals in the southern part of the country. Mexico Energy Data, Statistics and Analysis, "Oil Exports, June 2010, www.eia.doe.gov/cabs/Mexico/Full.html.

³⁸ Most Saudi exports move by tanker from Gulf terminals at Ras Tanura and Ju'aymah. Department of State, Background Note: Saudi Arabia, Oct. 25, 2010, www.state.gov/r/pa/ei/bgn/3584.htm.

³⁹ Kern County produced 292,000 bpd of heavy oil in 2010. Oil & Gas Journal, "Special Report: EOR/Heavy Oil Survey," April 19, 2010.

⁴⁰ Kern crude has a sulfur content of 1.2 percent. California Energy Commission, California Crude Oil Production and Imports, April 2006, pg. 5, <http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF>. Kern crude also has high TAN, with numbers ranging from 2.2 to 3.2. *Id.*, pg. 3.

refinery capacity. Three refineries with the combined capacity of 107,000 barrels per day (bpd) are located in Kern county.⁴¹ Over 500,000 bpd of additional refinery capacity is located within 120 miles of the Kern River and Sunset-Midway Fields.⁴² While refiners in California have to consider the corrosive properties of Bakersfield Heavy blend crude, relative few pipeline miles are dedicated to its transport.

II. Comparisons between the United States and Alberta pipeline systems

After observing the corrosive characteristics of diluted bitumen, the authors of *Tar Sands Pipeline Safety Risks* looked for data showing the safety record of pipelines carrying diluted bitumen. Unfortunately, there is little safety data regarding dedicated diluted bitumen pipelines. To date, the United States has had little experience with such pipelines. The first dedicated diluted bitumen pipeline in the United States, the Alberta Clipper, began operation in April 2010.⁴³ The second dedicated diluted bitumen pipeline, TransCanada's Keystone I pipeline, began operation in June 2010.⁴⁴ During the first ten months of operation, the Keystone I pipeline has already reported nine spills to the National Response Center.⁴⁵ Three of these spills were reported to PHMSA.⁴⁶ While this rate of pipeline failure is 75% above the national average,⁴⁷ ten months provides a very short temporal reference and even with a particularly corrosive product, pipeline corrosion develops over time.

The Alberta pipeline system has carried significantly higher quantities of diluted bitumen during a longer time period than the U.S. system. The first commercial tar sands mining, extraction and

⁴¹ Big West Refinery with a capacity of 66,000 bpd, Kern Oil & Refining Co. with a capacity of 26,000 bpd, and San Joaquin Refining Co. with a capacity of 15,000 bpd are all located in Bakersfield, CA. Energy Information Administration, "Ranking of U.S. Refineries," September 2010, <http://www.eia.doe.gov/ncic/rankings/refineries.htm>.

⁴² Chevron has a 265,500 bpd refinery in El Segundo, CA and BP has a refinery with 265,000 U.S. in Los Angeles, both less than 120 miles from Bakersfield. *Id.*

⁴³ Enbridge, "Alberta Clipper," <http://www.enbridge-expansion.com/expansion/main.aspx?id=1218>

⁴⁴ Downstream Today, "Oil Flows Through Keystone, June 9, 2010, http://www.downstreamtoday.com/news/article.aspx?a_id=22938&AspxAutoDetectCookieSupport=1.

⁴⁵ National Response Center, <http://www.nrc.uscg.mil/apex/f?p=109:2:1537649701388692::NO::>

⁴⁶ Keystone reported spills on May 21, 2010 (ID 201000119), June 23, 2010 (ID 20100166) and August 19, 2010 (ID 20100200) to PHMSA (<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Hazardous%20Liquid%20Accident%20PHMSA%20F7000-1%20Rev.01-2010.zip>).

⁴⁷ Keystone has 1,073 miles of pipeline in the United States (<http://www.keystonepipeline.state.gov/clientsite/keystone.nsf?Open>). Three incidents reported to PHMSA over a 10 month period for a 1,073 mile pipeline amounts to 0.00028 reportable spills per mile of pipeline (3 reported spills / 10 months / 1,073 miles of Keystone pipeline * pipeline miles = 0.00028 spills per mile per month). PHMSA regulates over 173,000 miles of hazardous liquid pipelines (http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/House%20T&I%20Integrity%20Management%20on%20Haz%20Liq%20Pipes_July%2015%202010.pdf). This system had 334 incidents reported to PHMSA during 2010 (http://primis.phmsa.dot.gov/comm/reports/safety/AllPSI.html?nocache=2656#_liquidon). Three hundred and thirty four incidents reported to PHMSA over a 12 month period for a 173,000 mile pipeline system amounts to 0.00016 reportable spills per mile of pipeline (334 reported spills / 12 months / 173,000 miles of U.S. hazardous liquid pipeline = 0.00016 spills per mile per month). Keystone's 0.00028 reportable spills per mile per month is 75% higher than the average U.S. rate of 0.00016 reportable spills per mile per month.

upgrading project commenced operations in 1967.⁴⁸ The first commercial *in situ* project was Imperial Oil's Cold Lake project, which began operation in 1985. Production from the tar sands region has expanded rapidly over the last fifteen years, increasing from slightly over 400,000 barrels per day in 1994 to 1.49 million bpd in 2009.⁴⁹ In 2009, sixty nine percent of all crude produced in Alberta was derived from tar sands bitumen.⁵⁰

An ideal study would have compared pipeline spill statistics between Alberta's diluted bitumen pipelines and its conventional crude pipelines. Unfortunately, the ERCB does not distinguish between diluted bitumen and conventional crude pipelines.⁵¹ The data available only allowed a comparison between the Alberta hazardous liquid system as a whole and the U.S. hazardous liquid system.

Using data compiled by PHMSA⁵² and the ERCB,⁵³ the report authors compared pipeline spills involving more than 26.3 gallons of product in the Alberta and U.S. hazardous liquid pipeline systems between 2002 and 2010. The authors then calculated an average total pipeline mileage in both systems, arriving at 163,500 miles for the United States system and 57,800 miles for the Alberta system. It should be noted that when calculating pipeline mileage in Alberta, the authors included abandoned, discontinued and permitted pipeline mileage, which served to increase total mileage in Alberta and lower the number of spills per pipeline mile.

Using this conservative approach, authors found there were 468 spills greater than 26.3 gallons per 10,000 miles of pipeline in Alberta between 2002 and 2010. Pipeline incident documentation in Alberta classifies spills based on eleven potential causes including internal corrosion.⁵⁴ Of these spills, 218 were due to internal corrosion. In contrast, the U.S. pipeline system had 153 spills greater than 26.3 gallons per 10,000 miles of pipeline during the same time, of which 13.6 were due to internal corrosion. In other words, between 2002 and 2010, the Alberta pipeline system had over three times as many spills per pipeline mile and over sixteen times as many spills due to internal corrosion.

⁴⁸ Strategy West Inc., "Canada's Oil Sands – A World-Scale Hydrocarbon Resource," July 2010, pg. 6, http://www.strategywest.com/downloads/StratWest_OilSands_2010.pdf.

⁴⁹ *Id.*

⁵⁰ In 2009 Alberta produced 236,700 cubic meters of tar sand crude, which converts to 1,490,000 barrels (Energy Resources Conservation Board, Alberta's Energy Reserves 2009 and Supply/Demand Outlook, 2010-2019, June 2010, p. 2-18, http://www.ercb.ca/docs/products/STs/st98_current.pdf.

⁵¹ See discussion in II.A.

⁵² PHMSA, Distribution, Transmission, and Liquid Accident and Incident Data, Using Hazardous Liquid Pipeline Incident Data between January 1, 2002 – Dec. 31, 2010.

<http://phmsa.dot.gov/portal/site/PHMSA/menuitem.ebdc7a8a7e39f2e55cf2031050248a0c/?vgnextoid=fdd2dfa122a1d110VgnVCM1000009ed07898RCRD&vgnextchannel=3430fb649a2dc110VgnVCM1000009ed07898RCRD&vgnextfnt=print>

⁵³ To collect and compile the Alberta pipeline data, NRDC contracted the consulting firm Visible Data Inc., of Calgary, Alberta, which provided the data for Alberta Utilities Board's report, Pipeline Performance in Alberta, 1990-2005.

⁵⁴ Data classifies spill by the following causes: construction damage, damage by others, earth movement, external corrosion, internal corrosion, joint failure, overpressure, pipe, valve/fitting, weld or other. Alberta Utilities Board, Pipeline Performance in Alberta, 1990-2005, April 2007, pg. 3, <http://www.ercb.ca/docs/documents/reports/r2007-a.pdf>.

Pipeline age cannot account for the disparity in spill rates between these systems. The majority of the U.S. pipeline system was built before 1970,⁵⁵ while the majority of the Alberta pipeline system was constructed after 1990.⁵⁶

A. ERCB does not know the failure rate of diluted bitumen pipelines in Alberta

In two press statements released on February 16, 2011, ERCB stated that its analysis had not identified a significant difference in failure frequency between pipelines handling conventional crude, synthetic crude or diluted bitumen.⁵⁷ This statement incorrectly implies that ERCB is able to distinguish conventional crude pipeline failures from diluted bitumen pipeline failures. However, ERCB does not require operators to define pipelines or pipeline incidents on the basis of the crude blend involved.⁵⁸ Blended bitumen, synthetic crude oil, and conventional crude oil are all classified simply as crude oil (or potentially oil well effluent).⁵⁹ ERCB's inability to detect differences between failure rates in conventional crude pipelines and diluted bitumen pipelines is not evidence that a differential does not exist. ERCB simply does not know.

B. ERCB appears to use a proxy that is composed primarily of conventional crude pipelines to cite a low failure rate for diluted bitumen pipelines

ERCB also implies that it tracks failure rates for pipelines shipping bitumen and blends of bitumen by noting that only eight spills have occurred "on pipelines potentially shipping bitumen and blends of bitumen" due to internal corrosion between 1975 and 2010.⁶⁰ The ERCB appears to be using a measure that focuses almost entirely on conventional crude pipeline spill rates. First, any time prior to the late 1980s, all tar sands production was limited to two mining operations that upgraded it to synthetic crude oil on site.⁶¹ Including incident data prior to this

⁵⁵ PHMSA. 2009 Hazardous Liquid Data, cited in Pipeline Safety Trust, <http://www.pstrust.org/ageofliquidpipelines.htm> (last accessed January 12, 2011).

⁵⁶ In 1995, Alberta had 49,600 km or 30,800 miles of crude, multiphase and other pipelines (ERCB, Pipeline Performance in Alberta, 1990-2005, April 2007, pg. 7, <http://www.ercb.ca/docs/documents/reports/r2007-a.pdf>). In 2010, Alberta had 65,600 miles of crude, multiphase and other pipelines (ERCB, CriticalControl access of ERCB pipeline database, January 7, 2011).

⁵⁷ ERCB, "ERCB Addresses Statements in Natural Resources Defense Council Pipeline Safety Report," Feb. 16, 2011, http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_304_264_0_43/http%3BercbContent/publishedcontent/publish/ercb_home/news/news_releases/2011/nr2011_04.aspx; "ERCB, "ERCB Responds to Natural Resources Defense Council," Feb. 16, 2011, http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_304_264_0_43/http%3BercbContent/publishedcontent/publish/ercb_home/news/news_releases/2011/nr2011_05.aspx.

⁵⁸ ERCB Directive 56: Energy Development Applications and Schedules, Table 6.6, June 2009, 6-59, <http://www.ercb.ca/docs/documents/directives/directive056.pdf>.

⁵⁹ Id.

⁶⁰ ERCB, ERCB responds to Natural Resources Defense Council, Press Release, Feb. 16, 2011, http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_304_264_0_43/http%3BercbContent/publishedcontent/publish/ercb_home/news/news_releases/2011/nr2011_05.aspx.

⁶¹ The first tar sands mining operations included the Suncor Millennium Mine, completed in 1967, and Syncrude's Mildred Lake Base Mine, completed in 1978. Strategy West Inc., "Existing and Proposed Canadian Commercial Oil Sands Projects," January 2011, pgs. 4-5. http://www.strategywest.com/downloads/StratWest_OSProjects_2011_01.pdf. These projects had upgrading facilities on-site. *Id.* pgs 2-3.

time period is relevant to synthetic and conventional crude, but not to diluted bitumen. Second, given the fact that ERCB does not track pipeline failures by product, it is clear that the agency is using some other measure as a proxy to determine potential diluted bitumen pipelines. That proxy appears to be pipeline size. ERCB appears to use pipeline size as that proxy, counting only the small percentage of crude pipelines with an outer diameter greater than 12 inches or 323.9 mm and making the inaccurate assumption that diluted bitumen is transported exclusively on those large pipelines.⁶² In contrast, Alberta tar sand production is structured in a manner that makes it significantly more likely that diluted bitumen is moved on smaller diameter pipelines.

- i. *Diluted bitumen pipeline infrastructure in Alberta has been used primarily to support low capacity, dispersed in situ projects*

Tar sands production is currently composed of five large surface mining operations clustered in a relatively small geographic area and seventy-nine smaller *in situ* drilling operations spread out in a much larger region. These surface mines are large, producing from 135,000 barrels per day (bpd) to 407,000 bpd.⁶³ Generally, bitumen from these mines is sent to nearby field upgraders to be converted to a less corrosive form called synthetic crude oil before being shipped to refineries in Canada or the United States. Exceptions include Suncor's mine which has been serviced by Enbridge's 540 km Athabasca pipeline since 1999,⁶⁴ and Shell's Muskeg mine, which has used the 493 kilometer Corridor pipeline to send diluted bitumen to be upgraded near Edmonton since 2003.⁶⁵ The Plains All American Pipeline, a 770 kilometer 20 inch to 24 inch pipeline owned by Plains All American going from Rainbow Lake to Edmonton,⁶⁶ now carries a combination of conventional crude and Peace River diluted bitumen. Very little of the large pipeline capacity devoted to exporting product for these operations has been used to move diluted bitumen before it was converted to synthetic crude.

In contrast, the more numerous *in situ* operations are much smaller, producing between 1,000 barrels per day (bdp) to 140,000 bpd.⁶⁷ They spread out over 135,000 square kilometers of territory. These production sites are the source of the majority of the diluted bitumen which is exported into the United States. *In situ* projects are composed of anywhere from a few dozen wells to several thousand, each requiring pipeline infrastructure. In addition, many of these sites are hundreds of kilometers from surface mining operations, other *in situ* projects or major pipeline hubs in Edmonton and Hardisty. They require additional pipeline infrastructure to get to the major pipeline transport hubs. These are smaller, lower capacity pipelines and to not include them in a comparison would mean excluding most of the diluted bitumen pipelines in Alberta.

⁶² ECRB Pipeline Incident database.

⁶³ Strategy West Inc., Existing and Proposed Canadian Commercial Oil Sands Projects, January 2011, pgs. 4-5.

⁶⁴ Penn Energy, Enbridge adds another Athabasca Pipeline expansion to accommodate growing oil sands production, Dec. 16, 2010, http://www.pennenergy.com/index/petroleum/display/4960355944/articles/pennenergy/petroleum/pipelines/2010/12/enbridge-adds_200mm.html.

⁶⁵ Herbst, Alan, Alberta Oil Sands: Supply Security Just a Pipeline Away, Nov. 2004, pg. 14,

<http://www.oildompublishing.com/pgi/pgiarchive/Nov04/alberta%20oil%20sands-11-04.pdf>.

⁶⁶ Reuters, Plains All American Pipeline, LP, Company Profile, <http://www.reuters.com/finance/stocks/companyProfile?symbol=PAA> (last visited March 22, 2011)

⁶⁷ Strategy West Inc., "Existing and Proposed Canadian Commercial Oil Sands Projects," January 2011, pgs. 6-14, http://www.strategywest.com/downloads/StratWest_OSProjects_2011_01.pdf.

ii. *Major large diameter pipelines in Alberta have historically been used to transport conventional crude*

A review of the major large diameter pipelines in Alberta shows that a majority are devoted to conventional crude. By the end of 2010, Alberta had 10,400 km of large diameter “crude” pipelines. Major large diameter pipelines in Alberta which exclusively transport conventional crude include:

- The Rangeland System, a 950 kilometer system which contains 8 inch to 16 inch pipelines;⁶⁸
- The Kinder Morgan Cochin pipeline, a 3060 km 12 inch pipeline from Fort Saskatchewan, Alberta to Windsor, Ontario;⁶⁹
- The Pembina Federated, a 210 km, 16 inch pipeline from Swan Hills to Edmonton;
- The AOSPL pipeline, a 707 kilometer, 24-30 inch pipeline which exclusively carries synthetic crude oil from Fort McMurray to Edmonton; and
- Enbridge’s 16-24 inch lines 1, 2 and 13, each of which has approximately 800 km in Alberta, for a total of 2400 km.⁷⁰

Until recently, there were very few large diameter dedicated diluted bitumen pipelines. As the *Tar Sands Pipeline Safety* report states, tar sands producers are increasing quantities of raw diluted bitumen being sent on international export lines to the United States. As part of this trend, diluted bitumen has become more common on Enbridge’s Lakehead system and is among the products on Enbridge’s lines 3 and 4, which have approximately 1600 km in Alberta.⁷¹ In 1999, Enbridge completed its Athabasca Pipeline, a 30 inch 540 kilometer line moving synthetic crude, heavy crude and diluted bitumen between the Athabasca tar sand deposits and Hardisty, Alberta.⁷² In May 2003, Kinder Morgan’s 24 inch 493 kilometer Corridor line, the first long distance large diameter dedicated diluted bitumen pipeline, began operation.⁷³ In 2010, two new

⁶⁸ *Id.*

⁶⁹ Kinder Morgan, Cochin Pipeline System, http://www.kne.com/business/products_pipelines/cochin.cfm

⁷⁰ Enbridge, “Enbridge Pipelines System Configuration,” Quarter 1, 2010,

<http://www.enbridge.com/DeliveringEnergy/OurPipelines/~media/Site%20Documents/Delivering%20Energy/Enb%20Refiners%20Book%202010%20Sys%20Config.ashx>;

http://www.energy.alberta.ca/Oil/pdfs/oil_pipelines_Map.pdf.

⁷¹ Enbridge, “Enbridge Pipelines System Configuration,” Quarter 1, 2010,

<http://www.enbridge.com/DeliveringEnergy/OurPipelines/~media/Site%20Documents/Delivering%20Energy/Enb%20Refiners%20Book%202010%20Sys%20Config.ashx>;

⁷² Enbridge, “Enbridge System and Athabasca System, <http://ar.enbridge.com/ar2008/management-discussion-analysis/liquids-pipelines/enbridge-system-and-athabasca-system/>; Enbridge, Petro-Canada to Ship on Enbridge’s Athabasca Pipeline, Sept. 28, 2000, <http://www.marketwire.com/press-release/Petro-Canada-to-Ship-on-Enbridges-Athabasca-Pipeline-521758.htm>.

⁷³ Reuters, Moody’s on Corridor Pipeline, July 6, 2007,

<http://uk.reuters.com/article/2007/07/06/idUKWNA202020070706>. The Corridor line was converted as a diluent line in 2009, Pipelines International, “Corridor slurry pipeline expansion complete,” 12 Aug., 2009, http://pipelinesinternational.com/news/corridor_slurry_pipeline_expansion_complete/004465/.

major new diluted bitumen pipelines were put into operation, the 1,607 km Alberta Clipper in April⁷⁴ and the 3,456 km Keystone I pipeline.⁷⁵ As you know, the 3,190 km Keystone XL pipeline is pending an environmental review process.

iii. *Diluted bitumen production pipelines may be classified as crude oil pipelines or multiphase pipelines*

It is also not clear that pipelines used to transport diluted bitumen from *in situ* facilities are classified as crude oil pipelines. It is also important to note that diluted bitumen occupies an ambiguous position between crude and multiphase product. Pipelines classifications in Alberta are self reported by operators. In ERCB *Directive 56: Energy Development Applications and Schedules*, Table 6.6, pipeline operators are instructed to identify pipelines moving multiphase fluids such as oil well effluent.⁷⁶ Pipelines are also characterized as oil effluent (multiphase) if they transport production from oil wells. Pipelines carrying blends from difference categories such as NG (natural gas) and OE (oil effluent) are determined on a case by case basis. Considering that diluted bitumen, as a mixture of bitumen and natural gas liquids, has multiphase properties and has historically required additional processing before being sent on conventional pipelines, it is not unlikely that some smaller diluted bitumen pipelines are listed as multiphase. Examples of the confusion regarding classification of diluted bitumen as oil effluent, multiphase product or processed crude abound. These include the ERCB's claim that conventional tar sands processing involves the removal of sulfur, which implies that tar sands diluted bitumen is not processed until it is upgraded to synthetic crude. It should also be noted that the pipeline industry refers to the Corridor line, first large diluted bitumen pipeline, as a "slurry line," again implying that diluted bitumen is unprocessed effluent.⁷⁷ Meanwhile, between 2002 and 2010, Alberta built over 7,800 miles of multiphase pipelines compared to 2,000 miles of new crude pipelines.⁷⁸ By 2010, Alberta's multiphase pipeline system made up the majority of its hazardous liquid pipeline system.⁷⁹

Given the margin for confusion in the classification of Alberta's pipelines by product, ERCB's suggestion that diluted bitumen, which comprises the largest and fastest growing petroleum product in Alberta, is not present in the largest and fastest growing segment of Alberta's pipeline system seems highly unlikely.

III. Diluted bitumen cleanup and emergency response

⁷⁴ Enbridge, Alberta Clipper and Southern Lights, <http://www.enbridge.com/Alberta-Clipper-and-Southern-Lights.aspx>.

⁷⁵ Pipelines International, "TransCanada supersedes Keystone Project," Dec. 2009, http://pipelinesinternational.com/news/transcanada_supersedes_keystone_project/009311/.

⁷⁶ ERCB, "Directive 56: Energy Development Applications and Schedules," Table 6.6, June 2009, 6-59, <http://www.ercb.ca/docs/documents/directives/directive056.pdf>.

⁷⁷ Pipelines International, "Corridor Slurry Pipeline Expansion Complete," August 12, 2009, http://pipelinesinternational.com/news/corridor_slurry_pipeline_expansion_complete/004465/.

⁷⁸ Between 2002 and 2010, Alberta's multiphase pipeline mileage increased from 26,281 miles to 34,085 miles; compared to crude pipelines, which increased from 9,638 miles to 11,670 miles. ERCB data provided by Visible Data Solutions.

⁷⁹ In 2010, Alberta had 34,085 miles of its 65,589 mile pipeline system was composed of multiphase pipelines. ERCB data provided by Visible Data Solutions.

It is worth noting that there has been little, if any, response to the problems diluted bitumen spills pose. The Tar Sands Pipeline Safety Risks report went into detail regarding some of the risks that a blend of raw bitumen and natural gas liquids can pose in the event of a spill, as well as the challenges cleanup operations face when confronted with diluted bitumen. These factors should material affect the development of spill response plans under 49 C.F.R. § 194.107.

A. Diluted bitumen is risky to the environment and human health

Diluted bitumen poses an elevated risk to the environment and public safety once a leak has occurred. While all crude oil spills are potentially hazardous, the low flash point and high vapor pressure of the natural gas liquid condensate used to dilute the diluted bitumen increases the risk of the leaked material exploding.⁸⁰ Diluted bitumen can form an ignitable and explosive mixture in the air at temperatures above 0 degrees Fahrenheit.⁸¹ This mixture can be ignited by heat, spark, static charge or flame.⁸² In addition, one of the potential toxic products of a diluted bitumen explosion includes hydrogen sulfide, a gas which can cause suffocation in concentrations over 100 parts per million⁸³ and is identified by producers as a potential hazard associated with a diluted bitumen spill.⁸⁴ Enbridge identified hydrogen sulfide as a potential risk to its field personnel during its cleanup of the Kalamazoo spill.⁸⁵

Diluted bitumen contains benzene, polycyclic aromatic hydrocarbons, and n-hexane, toxins that can affect the human central nervous systems.⁸⁶ A recent report filed by the Michigan Department of Community Health found that nearly 60 percent of individuals living in the vicinity of the Kalamazoo spill experienced respiratory, gastrointestinal, and neurological symptoms consistent with acute exposure to benzene and other petroleum related chemicals.⁸⁷ In

⁸⁰ There are numerous cases of pipeline explosions involving NGL condensate, including the January 1, 2011 explosion of a NGL condensate line in northern Alberta ("Pengrowth investigates pipeline explosion in northern Alberta," *The Globe and Mail*, 2 Jan. 2011, <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/pengrowth-investigates-pipeline-explosion-in-northern-alberta/article1855533/>, last accessed 12 Jan. 2011); and the 2007 explosion of an NGL pipeline near Fort Worth Texas after it had been ruptured by a third party ("No Injuries In Parker Co. Gas Pipeline Explosion," *AP/CBS 11 News*, 12 May 2007, http://www.keiberginc.com/web_news_files/pipeline-explosion-pr1.pdf, last accessed 12 Jan. 2011).

⁸¹ "Material Safety Data Sheet: Natural Gas Condensates," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2480179, last accessed 12 Jan. 2011.

⁸² "Material Safety Data Sheet: Natural Gas Condensate, Petroleum," Oneok, 2009, <http://www.oneokpartners.com/en/CorporateResponsibility/-/media/ONEOK/SafetyDocs/Natural%20Gas%20Condensate%20Petroleum.ashx>, last accessed 12 Jan. 2011.

⁸³ "Hydrogen Sulfide," Occupational Safety and Health Administration, Fact Sheet, 2005, http://www.osha.gov/OshDoc/data/Hurricane_Facts/hydrogen_sulfide_fact.pdf, last accessed 12 Jan. 2011.

⁸⁴ "Material Safety Data Sheet: DilBit Cold Lake Blend," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2479752, last accessed 12 Jan. 2011. In addition to hydrogen sulfide, combustion of diluted bitumen also produces carbon monoxide and sulfur dioxide.

⁸⁵ *Enbridge Line 6B 608 Pipeline Release, Marshall Michigan, Health and Safety Plan*, Enbridge, Inc., 2010, http://www.epa.gov/enbridgespill/pdfs/finalworkplanpdfs/enbridge_final_healthsafety_20100819.pdf, last accessed 12 Jan. 2011.

⁸⁶ "Material Safety Data Sheet: DilBit Cold Lake Blend," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2479752, last accessed 12 Jan. 2011.

⁸⁷ Martha Stanbury et al., *Acute Health Effects of the Enbridge Oil Spill*, Lansing, MI: Michigan Department of Community Health, November 2010, http://www.michigan.gov/documents/mdch/enbridge_oil_spill_epi_report_with_cover_11_22_10_339101_7.pdf, last accessed 12 Jan. 2011.

addition to their short term effects, long term exposure to benzene and polycyclic aromatic hydrocarbons has been known to cause cancer.⁸⁸

Diluted bitumen also contains vanadium, nickel, arsenic and other heavy metals in significantly larger quantities than occur in conventional crude.⁸⁹ These heavy metals have a variety of toxic effects, are not biodegradable, and can accumulate in the environment to become health hazards to wildlife and to people.⁹⁰

B. Diluted bitumen creates cleanup challenges

The characteristics of diluted bitumen create challenges for cleanup efforts in rivers and wetland environments. In the case of conventional oil spills, mechanical devices such as booms, skimmers, and sorbent materials—described by the Environmental Protection Agency (EPA) as the primary line of defense against oil spills in the United States,⁹¹ contain and recover oil floating on the water surface.⁹² However, unlike conventional crude oils the majority of diluted bitumen is composed of raw bitumen which is heavier than water. Following a release, the heavier fractions of diluted bitumen will sink into the water column and wetland sediments. In these cases, the cleanup of a diluted bitumen spill may require significantly more dredging than a conventional oil spill.⁹³ Further, heavy oil exposed to sunlight tends to form a dense, sticky substance that is difficult to remove from rock and sediments.⁹⁴ Removing this tarry substance from river sediment and shores requires more aggressive cleanup operations than required by conventional oil spills.⁹⁵ These factors increase both the economic and environmental costs of diluted bitumen spills.

⁸⁸ *Toxicological Profile for Polycyclic Aromatic Hydrocarbons*, Agency for Toxic Substances and Disease Registry, 1995, <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=122&tid=25>, last accessed 12 Jan. 2011.

Benzene, Agency for Toxic Substances and Disease Registry, 1995, <http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=14>, last accessed 12 Jan. 2011.

⁸⁹ “Athabasca Bitumen,” Environment Canada, Emergencies Science and Technology Division, http://www.etc-cte.ec.gc.ca/databases/OilProperties/pdf/WEB_Athabasca_Bitumen.pdf, last accessed 12 Jan. 2011.

“Tar Sands,” South Dakota Sierra Club, <http://southdakota.sierraclub.org/LivingRiver/tarsands.htm>, last accessed 12 Jan. 2011.

⁹⁰ The bioaccumulation of heavy metals is well established in academic literature (see, for example, R. Vinodhini and M. Narayanan, *Bioaccumulation of heavy metals in organs of fresh water fish Cyprinus carpio (Common carp)*, Int. J. Environ. Sci. Tech, 5 (2), Spring 2008, 179-182, <http://www.ceers.org/ijest/issues/full/v5/n2/502005.pdf>, last accessed 12 Jan. 2011). Heavy metals are elemental in nature and cannot biodegrade and have a variety of toxic effects (“Toxicological Profiles,” Agency for Toxic Substances and Disease Registry, 2010, <http://www.atsdr.cdc.gov/toxprofiles/index.asp>, last accessed 12 Jan. 2011).

⁹¹ “Oil Spill Response Techniques,” EPA Emergency Management, Environmental Protection Agency, 2009, <http://www.epa.gov/oem/content/learning/oiltech.htm>, last accessed 12 Jan. 2011.

⁹² *Understanding Oil Spills and Oil Spill Response*, Environmental Protection Agency, 2009, Chapter 2: Mechanical Containment and Recovery of Oil Following a Spill, http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap2.pdf, last accessed 12 Jan. 2011.

⁹³ *The Northern Great Plains at Risk: Oil Spill Planning Deficiencies in Keystone Pipeline System*, Plains Justice, 2010, p. 7, http://plainsjustice.org/files/Keystone_XL/Keystone%20Pipeline%20Oil%20Spill%20Response%20Planning%20Report%202010-11-23%20FINAL.pdf, last accessed 12 Jan. 2011.

⁹⁴ *Understanding Oil Spills and Oil Spill Response*, Environmental Protection Agency, 2009, Chapter 4: Shoreline Cleanup of Oil Spills, http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap4.pdf.

⁹⁵ *Understanding Oil Spills and Oil Spill Response*, Environmental Protection Agency, 2009, Chapter 4: Shoreline Cleanup of Oil Spills, http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap4.pdf.

IV. Conclusion

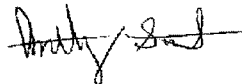
Given the potential risks that diluted bitumen pipelines pose to public safety, critical water resources and the environmental assets, the only responsible course is to do due diligence on these pipelines. We recommend that PHMSA evaluate the risks of pipelines transporting crude with the characteristics of diluted bitumen and promulgate the rules and standards to address these risks. We also recommend that PHMSA ask the State Department to wait for the PHMSA evaluation and analysis so that this can be included in the draft SEIS for the proposed Keystone XL pipeline project. As the agency with jurisdiction over hazardous liquid pipeline safety, a cooperating agency in the National Environmental Policy Act (NEPA) review of the Keystone XL pipeline project and an advising agency in the Presidential Permit process listed under Executive Order 13337, PHMSA is a critical participant in the evaluation of the Keystone XL pipeline project.

Thank you for taking this analysis into consideration. If you have any questions about this more detailed analysis, please contact us.

Respectfully submitted,

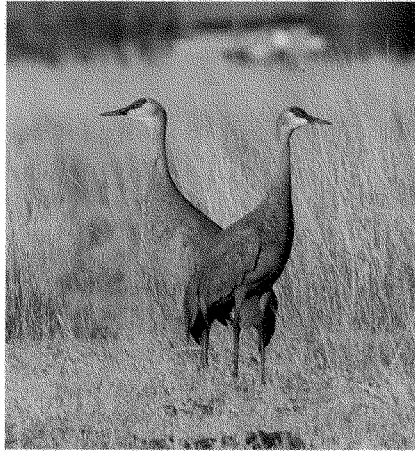


Susan Casey-Lefkowitz
 Director, International Program
 Natural Resources Defense Council
 1200 New York Ave., NW, Suite 400
 Washington, DC 20005
 Tel: 202-289-2366
 Email: sclefkowitz@nrdc.org



Anthony Swift
 Attorney, International Program
 Natural Resources Defense Council
 1200 New York Ave., NW, Suite 400
 Washington, DC 20005
 Tel: 202.513.6276
 Email: aswift@nrdc.org

Tar Sands Pipelines Safety Risks



FEBRUARY 2011

A JOINT REPORT BY:

Natural Resources Defense Council
National Wildlife Federation
Pipeline Safety Trust
Sierra Club

AUTHORS:

Anthony Swift
Susan Casey-Lefkowitz
Elizabeth Shope
*Natural Resources
Defense Council*



About NRDC

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at www.nrdc.org

About National Wildlife Federation

The National Wildlife Federation is America's largest conservation organization. We work with more than 4 million members, partners and supporters in communities across the country to protect and restore wildlife habitat, confront global warming and connect with nature. Visit us at www.nwf.org

About the Pipeline Safety Trust

The Pipeline Safety Trust is the only national nonprofit that focuses on pipeline safety. We promote pipeline safety through education and advocacy, by increasing access to information, and by building partnerships with residents, safety advocates, government, and industry, that result in safer communities and a healthier environment. Visit us at www.pstrust.org

About Sierra Club

The Sierra Club's members and supporters are more than 1.3 million of your friends and neighbors. Inspired by nature, we work together to protect our communities and the planet. The Club is America's oldest, largest and most influential grassroots environmental organization. Visit us at www.sierraclub.org

Acknowledgements

The report authors would like to thank the following people for their contributions to and review of the report: Carl Weimer and Rebecca Craven, Pipeline Safety Trust; Ryan Salmon and Beth Wallace, National Wildlife Federation; Kristina Johnson and Kate Colarulli, Sierra Club; Kenny Bruno, Corporate Ethics International; Richard Kuprewicz; Paul Blackburn and Carrie La Seur, Plains Justice; Nathan Lemphers, Pembina Institute; Steve Hamilton, Michigan State University; Liz Barratt-Brown, Josh Mogerman, and Carlita Salazar, Natural Resources Defense Council.

Cover photos:
 Sandhill Cranes in Nebraska © John Carrel
 Oil siphon downstream from Enbridge's Kalamazoo River spill © United States Environmental Protection Agency

Copyright 2011 Natural Resources Defense Council.
 This report is available online at www.stopdirtyfuck.org
 This report is printed on paper that is 100 percent post-consumer recycled fiber, processed chlorine free.

Executive Summary

Tar sands crude oil pipeline companies may be putting America's public safety at risk. Increasingly, pipelines transporting tar sands crude oil into the United States are carrying diluted bitumen or "DilBit"—a highly corrosive, acidic, and potentially unstable blend of thick raw bitumen and volatile natural gas liquid condensate—raising risks of spills and damage to communities along their paths. The impacts of tar sands production are well known. Tar sands extraction in Canada destroys Boreal forests and wetlands, causes high levels of greenhouse gas pollution, and leaves behind immense lakes of toxic waste. Less well understood, however, is the increased risk and potential harm that can be caused by *transporting* the raw form of tar sands oil (bitumen) through pipelines to refineries in the United States.

Currently, tar sands crude oil pipeline companies are using conventional pipeline technology to transport this DilBit. These pipelines, which require higher operating temperatures and pressures to move the thick material through a pipe, appear to pose new and significant risks of pipeline leaks or ruptures due to corrosion, as well as problems with leak detection and safety problems from the unstable mixture. There are many indications that DilBit is significantly more corrosive to pipeline systems than conventional crude. For example, the Alberta pipeline system has had approximately sixteen times as many spills due to internal corrosion as the U.S. system. Yet, the safety and spill response standards used by the United States to regulate pipeline transport of bitumen are designed for conventional oil.

DilBit is the primary product being transported through existing pipelines in the Midwest and would be transported in a proposed pipeline to the Gulf Coast. DilBit pipelines threaten ecologically important lands and waters from the Great Lakes to the Ogallala Aquifer. Moreover, the United States is on a path to lock itself into a long-term reliance on pipelines that may not be operated or regulated adequately to meet the unique safety requirements for DilBit for decades to come.

There are several steps that the United States can and should take in order to prevent future DilBit pipeline spills. These precautionary steps are essential for protecting farmland, wildlife habitat, and critical water resources—and should be put in place before rushing to approve risky infrastructure that Americans will be locked into using for decades to come:

- **Evaluate the need for new U.S. pipeline safety regulations.** Older safety standards designed for conventional oil may not provide adequate protection for communities and ecosystems in the vicinity of a DilBit

pipeline. The Department of Transportation (DOT) should analyze and address the potential risks associated with the transport of DilBit at the high temperatures and pressures at which those pipelines operate and put new regulations in place as necessary to address these risks.

- **The oil pipeline industry should take special precautions for pipelines transporting DilBit.** Until appropriate regulations are in place, oil pipeline companies should use the appropriate technology to protect against corrosion of their pipelines, to ensure that the smallest leaks can be detected in the shortest time that is technologically possible, and companies should ensure sufficient spill response assets are in place to contain a spill upon detection.
- **Improve spill response planning for DilBit pipelines.** Spill response planning for DilBit pipelines should be done through a public process in close consultation with local emergency response teams and communities.
- **New DilBit pipeline construction and development should not be considered until adequate safety regulations for DilBit pipelines are in place.** The next major proposed DilBit pipeline is TransCanada's Keystone XL pipeline. This pipeline approval process should be put on hold until the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) evaluates the risks of DilBit pipelines and ensures that adequate safety regulations for DilBit pipelines are in place.
- **Reduce U.S. demand for oil, especially for tar sands oil.** The United States can dramatically cut oil consumption by reinforcing existing reduction programs, such as efficiency standards for vehicles, and through new investments in alternatives to oil.

INTRODUCTION

Tar sands crude oil pipeline companies may be putting America's public safety at risk as pipelines transporting tar sands crude oil into the United States are increasingly carrying a more abrasive and corrosive mix—diluted bitumen or “DilBit”—raising risks of spills and damage to communities along their paths. While the impacts of tar sands production are well known—destruction of Boreal forests and wetlands, high levels of greenhouse gas pollution, and immense amounts of toxic waste—less well known is the increased risk and potential harm that can be caused by transporting the raw form of tar sands oil (bitumen) through pipelines to refineries in the United States.

In the past, the vast majority of tar sands bitumen was upgraded in Canada before coming into the United States as synthetic crude oil. However, more often now bitumen is

diluted and piped to U.S. refineries after being strip mined or melted from the tar sands under Canada's Boreal forest in Alberta. Bitumen is not the same as conventional oil; it has characteristics that make it potentially more dangerous. Nonetheless, the safety and spill response standards used by the United States to regulate pipeline transport of bitumen are designed for conventional crude oil.

This report shows that with an increasing trend of more bitumen coming into U.S. pipelines, it is important that the American public understands the characteristics of bitumen in a pipe that are potentially a threat to health and safety. The United States needs to ensure that appropriate oil pipeline safety and spill response standards that address the higher risks associated with transporting corrosive and acidic bitumen are in place. Until these safety and spill response standards are adopted, the United States should put a hold on the consideration of new tar sands pipelines.



A view of Lake Michigan, one of the threatened resources threatened by pollution from tar sands pipelines.

TAR SANDS MOVEMENT INTO THE UNITED STATES

Tar sands crude oil pipeline companies are using conventional pipeline technology to transport diluted bitumen or “DilBit,” a highly corrosive, acidic, and potentially unstable blend of thick raw bitumen and volatile natural gas liquid condensate. In order to become usable transportation fuels, DilBit can only be processed by certain refineries that have built the capacity to handle very heavy crudes. With Canadian upgraders operating at full capacity, oil companies have started transporting more of the raw tar sands to U.S. refineries that can either already take the heavier oil or need to build additional upgrading capacity.

Historically, the United States has imported the majority of tar sands crude from Canada in the form of synthetic crude oil, a substance similar to conventional crude oil that has already gone through an initial upgrading process. Importing tar sands oil into the United States as DilBit—instead of synthetic crude oil—is a recent and growing development.¹ Without much public knowledge or a change in safety standards, U.S. pipelines are carrying increasing amounts of the corrosive raw form of tar sands oil. In fact, over the last

ten years, DilBit exports to the United States have increased almost fivefold, to 550,000 barrels per day (bpd) in 2010—more than half of the approximately 900,000 bpd of tar sands oil currently flowing into the United States.² By 2019, Canadian tar sands producers plan to triple this amount to as much as 1.5 million bpd of DilBit.³

DilBit is the primary product being transported through the new TransCanada Keystone pipeline that runs from Alberta's tar sands to Illinois and Oklahoma,⁴ and also through Enbridge's recently-built Alberta Clipper pipeline, which terminates in Wisconsin.⁵ In addition, DilBit is transported through the existing Enbridge Lakehead system that brings both conventional oil and tar sands from the Canadian border to Minnesota, Wisconsin, Illinois, Indiana, and Michigan.

Transporting DilBit is also the primary purpose of TransCanada's proposed Keystone XL pipeline, which would run nearly 2000 miles from Alberta through some of America's most sensitive lands and aquifers on the way to refineries on the U.S. Gulf Coast.⁶ This infrastructure will lock the United States into a continued reliance on pipelines that may not be operated or regulated adequately to meet the unique safety requirements for DilBit for decades to come.

Tar Sands Oil Extraction Risks

Bitumen deposits are found in Northeastern Alberta under Canada's Boreal forest and wetlands in an area approximately the size of Florida.⁷ To extract the bitumen, the oil industry strip mines and drills millions of acres of sensitive wildlife habitat—disrupting critical terrestrial carbon reservoirs in peatlands. Because it requires large amounts of energy, production of synthetic crude oil from tar sands is estimated to release at least three times the greenhouse gas emissions per barrel as compared to that of conventional crude oil.⁸ In addition to its high carbon costs, tar sands oil production:

- Requires two to five barrels of water for each barrel of bitumen extracted⁹
- Has already created over 65 square miles of toxic waste ponds¹⁰
- Threatens the health of downstream indigenous communities¹¹
- Is likely to cause the loss of millions of migratory birds that nest in the forests and wetlands of the region¹²

Tar sands excavated through strip mining are processed with hot water to separate the bitumen from the sand and clay. In drilling, most companies use a method called steam-assisted gravity drainage (SAGD) where steam is pumped under the ground to melt the bitumen out of the sand so that it liquefies enough to be pumped out. Then, in both cases, the bitumen must be diluted with other material—allowing it to flow through a pipe to the upgrading and refining facilities.



© David Dwyer, The Canadian Press
Suncor's Millarville Tar Sands Mine east of the Athabasca River



© Keith Jones

“We’re taking the Boreal forest and just trashing it for this dirty, heavy, ugly stuff. Let’s make some solar panels and windmills. Let’s do something clean.”

— Paul Judice, educator and retired environmental engineer in Southeast Texas

DILBIT PIPELINE SAFETY CONCERNS

As tar sands oil companies send increasing volumes of DilBit to the United States, the risks of pipeline spills are becoming more apparent. DilBit pipelines, which require higher operating temperatures and pressures to move the thick material through a pipe, appear to pose new and significant risks of pipeline leaks or ruptures due to corrosion, as well as problems with leak detection and safety problems from the instability of DilBit. For example, in July 2010, an Enbridge tar sands pipeline spilled over 840,000 gallons of diluted bitumen into Michigan's Kalamazoo River watershed.¹⁵

DilBit's Characteristics Can Lead to Weakening of Pipelines

There are many indications that DilBit is significantly more corrosive to pipeline systems than conventional crude. Bitumen blends are more acidic, thick, and sulfuric than conventional crude oil. DilBit contains fifteen to twenty times higher acid concentrations than conventional crudes and five to ten times as much sulfur as conventional crudes.¹⁴ It is up to seventy times more viscous than conventional crudes.¹⁵ The additional sulfur can lead to the weakening or embrittlement of pipelines.¹⁶ DilBit also has high concentrations of chloride salts which can lead to chloride stress corrosion in high temperature pipelines.¹⁷ Refiners have found tar sands derived crude to contain significantly higher quantities of abrasive quartz sand particles than conventional crude.¹⁸

This combination of chemical corrosion and physical abrasion can dramatically increase the rate of pipeline deterioration.¹⁹ Despite these significant differences, PHMSA does not distinguish between conventional crude and DilBit when setting minimum standards for oil pipelines.

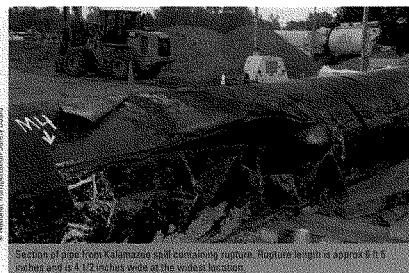
The risks of corrosion and the abrasive nature of DilBit are made worse by the relatively high heat and pressure at which these pipelines are operated in order to move the thick DilBit through the pipe. Industry defines a high pressure pipeline as one that operates over 600 pounds per square inch (psi).²¹ Due to the high viscosity or thickness of DilBit, pipelines—such as the Keystone tar sands pipeline—operate at pressures up to 1440 psi and at temperatures up to 158 degrees Fahrenheit.²² In contrast, conventional crude pipelines generally run at ambient temperatures and lower pressures.

Higher temperatures thin the DilBit and increase its speed through the pipeline. They also increase the speed at which acids and other chemicals corrode the pipeline. An accepted industry rule of thumb is that the rate of corrosion doubles with every 20 degree Fahrenheit increase in temperature.²³ At high temperatures, the mixture of light, gaseous condensate, and thick, heavy bitumen, can become unstable.²⁴ Variations in pipeline pressure can cause the natural gas liquid condensate to change from liquid to gas form. This creates gas bubbles within the pipeline. When these bubbles form and collapse they release bursts of high pressure that can deform pipeline metal.²⁵ The instability of DilBit can render pipelines particularly susceptible to ruptures caused by pressure spikes.²⁶

Leaks in DilBit Pipelines Can Be Difficult to Detect

Leaks in DilBit pipelines are often difficult to detect. As stated above, as DilBit flows through a pipeline, pressure changes within the pipeline can cause the natural gas liquid condensate component to move from liquid to gas phase.²⁷ This forms a gas bubble that can impede the flow of oil. Because this phenomenon—known as column

Diluted Bitumen's Characteristics			
Characteristics	Conventional Crude ²⁸	Diluted Bitumen	Point of Reference
Acidity (Total Acid Number - TAN)	0-0.3 ²¹	0.856-4.32 ²²	Refiners require special measures to prevent corrosion when processing crudes with a TAN greater than 0.5. ²³
Viscosity	5 Centistokes (cST)	201 cST	Gasoline at the pump has a viscosity of 0.4-0.8 cST. ²⁴
Sulfur Content	0.34% - 0.57% ²⁵	3.37%	Gasoline has a sulfur content of less than 0.0000008%.
Pipeline Temperature	Less than 100° F ²⁶	158° F	Conventional crude pipelines tend to run at ambient temperatures.
Pipeline Pressure	600 pounds per square inch (psi) ²⁷	1440 psi	Industry defines a high pressure pipeline as one that operates at over 600 psi. ²⁸
Abrasives (quartz and silicates)	Nil	Keystone XL pipeline maximum capacity would mean over 125 pounds of quartz sand and aluminosilicates per minute. ²⁹	Common sandblasters use between 1.5 and 47 pounds of sand per minute. ³⁰



Section of pipe from Kalamazoo spill containing rupture. Rupture length is approx 8 ft 6 inches and is 4 1/2 inches wide at the widest location.

separation—presents many of the same signs as a leak to pipeline operators, real leaks may go unnoticed. Because the proper response to column separation is to pump more oil through the pipeline, misdiagnoses can be devastating.³⁸ During the Kalamazoo River spill, the Enbridge pipeline gushed for more than twelve hours before the pipeline was finally shut down, and initial investigation indicates that the pipeline's monitoring data were interpreted to indicate a column separation rather than a leak.³⁹ Ultimately, emergency responders were not notified until more than nineteen hours after the spill began.⁴⁰

DilBit is Risky to the Environment and Human Health

DilBit poses an elevated risk to the environment and public safety once a leak has occurred. While all crude oil spills are potentially hazardous, the low flash point and high vapor pressure of the natural gas liquid condensate used to dilute the DilBit increase the risk of the leaked material exploding.⁴¹ DilBit can form an ignitable and explosive mixture in the air at temperatures above 0 degrees Fahrenheit.⁴² This mixture can be ignited by heat, spark, static charge, or flame.⁴³ In addition, one of the potential toxic products of a DilBit explosion is hydrogen sulfide, a gas which can cause suffocation in concentrations over 100 parts per million and is identified by producers as a potential hazard associated with a DilBit spill.⁴⁴ Enbridge identified hydrogen sulfide as a potential risk to its field personnel during its cleanup of the Kalamazoo River spill.⁴⁵

DilBit contains benzene, polycyclic aromatic hydrocarbons, and n-hexane, toxins that can affect the human central nervous systems.⁴⁶ A recent report filed by the Michigan Department of Community Health found that nearly 60 percent of individuals living in the vicinity of the Kalamazoo River spill experienced respiratory,

Safety of drinking water matters

Residents along the pipeline path put protection of their drinking water above arguments in favor of the proposed Keystone XL tar sands pipeline. Public opinion research, conducted recently by NRDC, shows deep concern about the possibility of tar sands pipelines leaking into water supplies, especially in Nebraska where the proposed Keystone XL tar sands pipeline would cross the Ogallala aquifer, a huge freshwater aquifer that provides drinking and agricultural water to eight states in the heartland of the United States. The research shows that residents believe investing in clean, renewable sources of energy is better than investing in a tar sands pipeline that will keep the United States reliant on oil into the future.

gastrointestinal, and neurological symptoms consistent with acute exposure to benzene and other petroleum related chemicals.⁴⁷ In addition to their short term effects, long term exposure to benzene and polycyclic aromatic hydrocarbons has been known to cause cancer.⁴⁸

DilBit also contains vanadium, nickel, arsenic, and other heavy metals in significantly larger quantities than occur in conventional crude.⁴⁹ These heavy metals have a variety of toxic effects, are not biodegradable, and can accumulate in the environment to become health hazards to wildlife and people.⁵⁰

DILBIT CLEANUP AND EMERGENCY RESPONSE

Clean up of DilBit poses special risks. The characteristics of DilBit create challenges for cleanup efforts in rivers and wetland environments. In the case of conventional oil spills, mechanical devices such as booms, skimmers, and sorbent materials—described by the Environmental Protection Agency (EPA) as the primary line of defense against oil spills in the United States—contain and recover oil floating on the water surface.⁵¹ However, unlike conventional crude oils, the majority of DilBit is composed of raw bitumen which is heavier than water. Following a release, the heavier fractions of DilBit will sink into the water column and wetland sediments. In these cases, the cleanup of a DilBit spill may require significantly more dredging than a conventional oil spill.⁵² Further, heavy oil exposed to sunlight tends to form a dense, sticky substance that is difficult to remove from rock and sediments.⁵³ Removing this tarry substance from river sediment and shores requires more aggressive cleanup operations than required by conventional oil spills.⁵⁴ These factors increase both the economic and environmental costs of DilBit spills.



"I just don't understand why we'd put our aquifer at risk. If oil gets into the water, we're done. You can't drink oily water and you can't irrigate crops with it."

— Randy Thompson, Nebraska landowner whose ranch would be crossed by the Keystone XL pipeline

The containment and cleanup of a DilBit spill requires significant personnel, equipment, supplies, and other resources. The Kalamazoo River spill required more than 2000 personnel, over 150,000 feet of boom, 175 heavy spill response trucks, 43 boats, and 48 oil skimmers.⁵⁵ Federal regulations for crude oil pipeline spill response lack specific standards and mandatory equipment and personnel requirements, and are therefore much weaker than regulations for other polluters, such as oil tankers and oil refineries.⁵⁶ While the Kalamazoo River spill occurred in a populated area where residents could notify authorities of the spill and significant private spill response equipment was nearby, other DilBit pipelines cross significantly more remote areas.⁵⁷ In

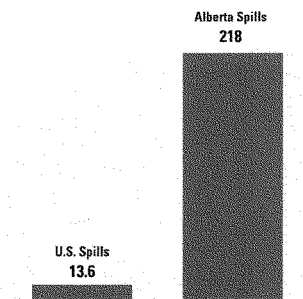
the entire area of Montana, Nebraska, North Dakota, and South Dakota, TransCanada—the operator of Keystone I and the proposed Keystone XL pipelines, and its private contractors—list a total of 8,000 feet of boom, eight spill response trailers, seven skimmers, and four boats available to respond to a spill.⁵⁸ Much of this equipment will take hours to transport on-site in the event of a spill in this large region.⁵⁹

HISTORY OF DILBIT TRANSPORTATION IN CANADA RAISES SAFETY CONCERNS⁶⁰

One indication of the potential additional hazards of DilBit to a pipeline is that the Alberta hazardous liquid pipeline system has a relatively high rate of pipeline failure from internal corrosion. While DilBit has not been common until recently in the United States pipeline system, it has composed a high proportion of the product on the Alberta pipeline system.⁶¹ In Alberta, tar sands producers have been using DilBit pipelines since the 1980s to move raw bitumen to upgrading facilities. By 2009, over two-thirds of all crude produced in Alberta was transported as DilBit at some point in its production process.⁶²

Over half of the pipelines currently operating in Alberta have been built in the last twenty years as the tar sands region developed.⁶³ In contrast, the majority of hazardous liquid pipelines in the United States are more than forty years old.⁶⁴

Comparison of Pipeline Spills per 10,000 Miles Caused by Internal Corrosion between 2002 and 2010



Internal corrosion caused more than sixteen times as many spills in the Alberta pipeline system as the U.S. system.

The corrosive characteristics of DilBit may account for the disparity between spill rates in the United States and Alberta hazardous pipeline systems. Comparison of pipeline spills greater than 26 gallons per 10,000 miles of pipeline caused by internal corrosion on the Alberta and United States onshore hazardous liquid pipeline system between 2002 and 2010.⁶

Source: NRDC Graph.

⁶ Internal corrosion caused 6.9 percent of the spills greater than 26 gallons on the United States onshore hazardous liquid pipeline system between 2002 and 2010. "Distribution, Transmission, and Liquid Accident and Incident Data," U. S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, 2002-2010, <http://www.phmsa.dot.gov/petal/site/PHMSA/menuitem.ebdc7a8a7e29f2e55c22031050248a0c/?vgnextoid=f6d2dfa722a1d110VgnVCM1000009ed07896RCRD&vgnextchannel=34307b649a2dc110VgnVCM1000009ed07896RCRD&vgnextfmt=print> (last accessed January 12, 2011). Internal corrosion caused 1757 of the 2705 spills greater than 26.3 gallons on the Alberta hazardous pipeline system, 64.98 incidents per 10,000 miles of Alberta pipelines, 46.5 percent, or 218 incidents per 10,000 miles, were caused by internal corrosion between 2002 and 2010.



The older a pipeline is the more attention that a pipeline company needs to pay to it because it may not have the same type of coating, same strength of steel, or had corrosion protections for its entire life. Despite its relatively recent construction, Alberta's hazardous liquid system had 218 spills greater than 26 gallons per 10,000 miles of pipeline caused by internal corrosion from 2002 to 2010, compared to 13.6 spills greater than 26 gallons per 10,000 miles of pipeline from internal corrosion reported in the United States to PHMSA during that same time period.⁶⁵ This rate of spills due to internal corrosion is sixteen times higher in Alberta than in the United States.

While differences in data collection and regulations between Alberta and the United States make it impossible to make a clear comparison of this data, the higher internal corrosion rates in Alberta certainly raise the yet unanswered question of whether the properties that are unique to DilBit are apt to cause the same corrosion problems in the United States as more and more DilBit flows south.



© Lucas Hamilton

"I'm worried about oil that we can't clean up, residing in the soils and sediments, potentially being a slow source of contamination into the plants and animals and releasing into the river."

— Stephen Hamilton, professor of Aquatic Ecology at Michigan State University and the President of the Kalamazoo River Watershed Council

DILBIT PUTTING U.S. SPECIAL PLACES AT RISK⁶⁶

With more DilBit coming into the United States in pipelines built under conventional oil standards, it is important to understand the water resources, habitat, and wildlife at risk from existing DilBit pipelines throughout the Midwest as well as from the proposed Keystone XL pipeline to Texas.

1 Great Lakes



The Great Lakes are the largest source of freshwater in the world, and provide drinking water for 40 million American and Canadian citizens.⁶⁷ Enbridge pipelines that sometimes carry DilBit run through the Great Lakes region close to Lake Superior, Lake Michigan, Lake Huron, and Lake Erie.⁶⁸

2 Lake St. Clair and the St. Clair River



The St. Clair River provides drinking water for millions in Southeast Michigan and was threatened by a potentially faulty section of the Enbridge pipeline that runs under the river and is due to be replaced in early 2011.⁶⁹ The St. Clair River drains into Lake St. Clair, the Detroit River, and Lake Erie.

3 Indiana Dunes



Enbridge pipelines run near the biologically rich and recreationally important Indiana Dunes, on the southern shore of Lake Michigan.⁷⁰

4 Deep Fork Wildlife Management Area



In Oklahoma, the proposed Keystone XL pipeline would cut through this 11,900 acre haven for game and non-game species, including Bobwhite Quail, turkeys, bobcats, and Bald Eagles.⁷¹

5 Native Prairies and the Threatened Topeka Shiner Minnow



In Kansas, the proposed Keystone XL pipeline would cross native prairies and may affect critically designated habitat for the federally endangered Topeka Shiner minnow.⁷²

6 Whooping Crane and Sandhill Crane Habitat



The proposed Keystone XL pipeline would cross the Platte River in Nebraska, an important stop-over site on the migration path of the endangered Whooping Crane. Sandhill Cranes also use the area as a nesting site.⁷³

7 Ogallala Aquifer



The proposed Keystone XL pipeline crosses the Ogallala Aquifer, one of the world's largest freshwater aquifers that provides 30 percent of the ground water used for irrigation in the United States, and drinking water for millions of Americans. The aquifer covers areas in South Dakota, Nebraska, Wyoming, Colorado, Kansas, Oklahoma, New Mexico, and Texas.

8 Prairie Potholes and Migratory Birds



In South Dakota, the Keystone XL pipeline route tracks the Central and Mississippi migratory bird flyways, and cuts through the prairie pothole ecosystem that is critically important nesting and migratory staging areas for many ducks, including Pintails and Mallards.⁷⁴

9 Shortgrass Prairie and Mountain Plover



The South Dakota Shortgrass prairie regions, through which the Keystone pipeline passes and the proposed Keystone XL pipeline would pass, are important habitat for the Mountain Plover, proposed for listing as threatened under the Endangered Species Act.⁷⁵

10 Pronghorn Antelope Habitat



The Keystone XL pipeline would traverse pronghorn antelope habitat in Montana, further fragmenting already-threatened migration routes.⁷⁶ Pronghorn are a unique American species whose movements are very sensitive to roads and human activity.

SELECT RIVERS THREATENED BY UNITED STATES DILBIT PIPELINES

Missouri River

The longest river on the continent and the route of the Lewis and Clark expedition, the Missouri is crossed by pipelines in numerous places, including by Keystone pipeline on the South Dakota-Nebraska border and the Kansas-Missouri border, by Enbridge pipelines in Missouri, and by the proposed Keystone XL pipeline in Montana, near the relatively isolated Upper Missouri River Breaks National Monument.⁷⁷

Yellowstone River

In Montana, the proposed Keystone XL pipeline would cross the Yellowstone River, a major tributary into the Missouri River and the longest undammed river in the lower 48 states. The river is of vital use for fishermen and recreationalists, and is a major irrigation source for farmers and ranchers.⁷⁸

Mississippi River

The Keystone pipeline crosses the Mississippi River in Missouri, near the confluence of the Mississippi and Missouri Rivers, and terminates just across the river in Illinois. Enbridge pipelines cross the northern part of the Mississippi River in Minnesota.

Kalamazoo River

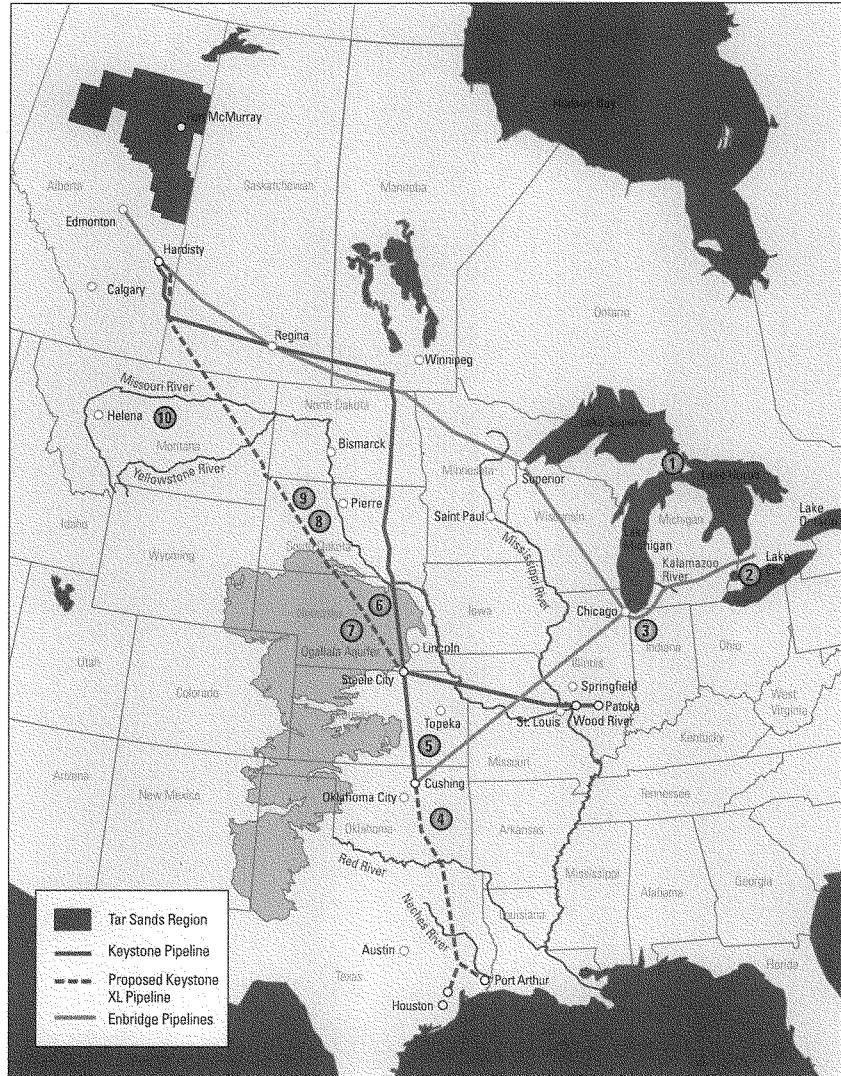
In Michigan, an Enbridge pipeline crosses the Kalamazoo River which flows into Lake Michigan. A spill from this pipeline has already damaged the river ecosystem and threatened nearby communities and the Great Lakes.⁷⁹

Red River

The Red River serves an important breeding ground for the highly endangered Interior Least Tern, which requires feeding areas with shallow waters and an abundance of small fish.⁸⁰ The proposed Keystone XL pipeline would cross the Red River on the Oklahoma-Texas border.

Neches River

The Neches River is the last river in East Texas with abundant wildlife, clean water, scenic river vistas, and forests. The proposed Keystone XL pipeline would cross the Neches River in Texas.⁸¹



ENSURING OUR SAFETY

There are several steps that the United States can and should take in order to prevent future DilBit pipeline spills. These precautionary steps are essential for protecting farmland, wildlife habitat, and critical water resources—and should be put in place before rushing to approve risky infrastructure that Americans will be locked into using for decades to come.

- **Evaluate the need for new U.S. pipeline safety regulations.** Older safety standards designed for conventional oil may not provide adequate protection for communities and ecosystems in the vicinity of a DilBit pipeline. The Department of Transportation should analyze and address the potential risks associated with the transport of DilBit at the high temperatures and pressures at which those pipelines operate and put new regulations in place as necessary to address these risks.
- **The oil pipeline industry should take special precautions for pipelines transporting DilBit.** Until appropriate regulations are in place, oil pipeline companies should use the appropriate technology to protect against corrosion of their pipelines, to ensure that the smallest leaks can be detected in the shortest time that is technologically possible, and companies should ensure sufficient spill response assets are in place to contain a spill upon detection.
- **Improve spill response planning for DilBit pipelines.** Spill response planning for DilBit pipelines should be done through a public process in close consultation with local emergency response teams and communities.
- **New DilBit pipeline construction and development should not be considered until adequate safety regulations for DilBit pipelines are in place.** The next major proposed DilBit pipeline is TransCanada's Keystone XL pipeline. This pipeline approval process should be put on hold until PHMSA evaluates the risks of DilBit pipelines and ensures that adequate safety regulations for DilBit pipelines are in place.
- **Reduce U.S. demand for oil, especially for tar sands oil.** The United States can dramatically cut oil consumption by reinforcing existing reduction programs, such as efficiency standards for vehicles, and through new investments in alternatives to oil.

U.S. pipelines are carrying increasing amounts of the corrosive raw form of tar sands oil under regulations meant for the less corrosive conventional oil.

ENDNOTES

- ¹ "Oil Sands Statistics 2000-2007," Canadian Association of Petroleum Producers, <http://membernet.capp.ca/raw.asp?x=1&dt=NTV&e=PDF&dn=34093> (last accessed January 12, 2011).
- ² The United States imported 550,000 bpd of blended bitumen (DilBit, SynBit, and DilSynBit) in the 1st quarter of 2010; this does not include synthetic crude oil. *Estimated Canadian Crude Oil Exports by Type and Destination, 2010 Q1*, National Energy Board, 2010, http://www.neb-one.gc.ca/cf-nsi/mrgynfrtn/ststc/crdlndprlmprdt/2010/stmtdcndrldxprtptdstm2010_q1.xls (last accessed January 12, 2011). The ERCB estimates that in 2009, Alberta exported 500,000 bpd of SCO (79,600 m3/day, p. 2-34) to refineries in the United States. Andy Burrows, Rick Marsh, Marie-Anne Kirsch et al., *Alberta's Energy Reserves 2009 Supply/Demand Outlook 2010-2019*, Calgary, Alberta: Energy Resources Conservation Board, 2010, http://www.ercb.ca/docs/products/STs/st98_current.pdf (last accessed January 12, 2011).
- ³ Andy Burrows, Rick Marsh, Marie-Anne Kirsch et al., *Alberta's Energy Reserves 2009 Supply/Demand Outlook 2010-2019*, Calgary, Alberta: Energy Resources Conservation Board, 2010, p. 3, http://www.ercb.ca/docs/products/STs/st98_current.pdf (last accessed January 12, 2011).
- ⁴ The Keystone pipeline has a capacity of 591,000 bpd. "Keystone Pipeline Project: Project Information," TransCanada Corporation Home, TransCanada Pipelines Limited, 2010, http://www.transcanada.com/project_information.html (last accessed January 12, 2011).
- ⁵ The Alberta Clipper Pipeline has a capacity of 450,000 bpd with an ultimate capacity of up to 800,000 bpd. "Alberta Clipper," Enbridge Expansion, Enbridge, 2011, <http://www.enbridge-expansion.com/expansion/main.aspx?id=1218> (last accessed January 12, 2011).
- ⁶ The Keystone XL pipeline would have a capacity of up to 900,000 bpd. "Project Home Page," U. S. Department of State: Keystone XL Pipeline Project, Enbridge, Inc., July 26, 2010, <http://www.keystonepipeline-xl.state.gov> (last accessed January 12, 2011).
- ⁷ *Frequently Asked Questions on the Development of Alberta's Energy Resources – Oil Sands*, Calgary, Alberta: Energy Resources Conservation Board, 2010, <http://www.ercb.ca/docs/public/EnerFAQs/PDF/EnerFAQs12-OilSands.pdf> (last accessed January 12, 2011).
- ⁸ *Development of Baseline Data and Analysis of Life Cycle Greenhouse Gas Emissions of Petroleum-Based Fuels*, National Energy Technology Laboratory, 2008, DOE/NETL-2009/1346. See tables 2-4 and 2-5 on p. 12.
- ⁹ Dan Weyniliowicz, Chris Severson-Baker and Mario Reynolds, *Oil Sands Fever: The Environmental Implications of Canada's Oil Sands Rush*, Alberta, Canada: The Pembina Institute, 2005.
- ¹⁰ Simon Dyer and Mark Huot, *Fact Sheet: Mining vs. In Situ*, Alberta, Canada: The Pembina Institute, 2010, <http://pubs.pembina.org/reports/mining-vs-in-situ.pdf> (last accessed January 12, 2011).
- ¹¹ Kevin Timoney, *A study of water and sediment quality as related to public health issues*, Fort Chipewyan, Alberta, Alberta, Canada: Nunee Health Board Society, 2007.
- ¹² Jeff Wells, Susan Casey-Lefkowitz, Gabriela Chavarria and Simon Dyer, *Danger in the Nursery: Impact on Birds of Tar Sands Oil Development in Canada's Boreal Forest*, Washington, DC: Natural Resources Defense Council, 2008, <http://www.nrdc.org/wildlife/borealbirds.asp> (last accessed January 12, 2011).
- ¹³ In a conference call, the CEO of Enbridge acknowledged that the Kalamazoo spill involved Cold Lake DilBit, a blend of 1/3 diluent and 2/3 bitumen. Eartha Jane Meber, "Pipeline spill underlines fears of new tar sands development," *The Michigan Messenger*, August 10, 2010, <http://michiganmessenger.com/40744/pipeline-spill-underlines-fears-of-new-tar-sands-development> (last accessed January 12, 2011). Enbridge has identified the source of the crude as Christina Lake / Foster Creek in situ sources currently transported as Cold Lake DilBit. *Enbridge Line 6B 608 Pipeline Release, Marshall Michigan, Health and Safety Plan*, Enbridge, Inc., 2010, http://www.epa.gov/enbridgespill/pdfs/finalworkplandpfs/enbridge_final_healthsafety_20100819.pdf (last accessed January 12, 2011). Chris Killian, "Enbridge says more oil spilled in Kalamazoo than it previously estimated," *The Kalamazoo Gazette*, December 2, 2010, http://www.mlive.com/news/kalamazoo/index.ssf/2010/12/enbridge_says_more_oil_spilled.html (last accessed January 12, 2011).
- ¹⁴ Gareth Crandall, *Non-Conventional Oil Market Outlook Presentation to: International Energy Agency, Conference on Non-Conventional Oil*, 2002, p. 4, <http://www.iea.org/work/2002/calgary/Crandall.pdf> (last accessed January 12, 2011).
- ¹⁵ *Canadian Crude Quick Reference Guide Version 0.54*, Crude Oil Quality Association, 2009, <http://www.cqqa-inc.org/102209CanadianCrudeReferenceGuide.pdf> (last accessed January 12, 2011).
- ¹⁶ William Lyons and Gary Plisga, *Standard Handbook of Petroleum and Natural Gas Engineering*, Burlington, MA: Gulf Professional Publishing, 2005, p. 4-521.
- ¹⁷ *Planning Ahead for Effective Canadian Crude Processing*, Baker Hughes, 2010, p. 4, http://www.bakerhughes.com/assets/media/whitepapers/4c2a3dffa7e1c3c740001d/file/28271-canadian_crudeoil_update_whitepaper_06-10.pdf&ts=1497549 (last accessed January 12, 2011); A. I. (Sandy) Williamson, *Degradation Mechanisms in the Oil Sands Industry*, Calgary, Alberta: Ammonite Corrosion Eng. Inc., 2006, Presentation to the National Association of Corrosion Engineers, slide 27, http://www.naccedmonton.com/pdf/FtMacPresentation/Ammonite_Degradation%20Mechanisms%20in%20OS%20Operations_NACE_Fort%20Mac_10%2006.pdf (last accessed January 12, 2011).
- ¹⁸ *2008 NPRA Q&A and Technology Forum: Answer Book*, Champion's Gate, FL: National Petrochemical and Refiners Association, 2008, Question 50: Desalting, http://www.npra.org/forms/uploadfiles/17C490000055.filename2008_DA_Answer_Book.pdf (last accessed January 12, 2011).
- ¹⁹ Henry Liu, *Pipeline Engineering*, Boca Raton, FL: CRC Press LLC, 2003, p. 317, http://books.google.com/books?id=v_TH5IAAd60C&pg=PA317&lpg=PA317&dq=erosion+corrosion+pipeline&source=bl&ots=6LwldWcyv&sig=jay3DrfaokGD3d0yCk2oem6E&hl=en&ei=SUQjLhOeC8gbw8KzRCA&sa=X&oi=book_result&ct=result&resnum=9&ved=0CFYQ6AEwCAw=onepage&q=erosion%20corrosion%20pipeline&f=false (last accessed January 12, 2011).
- ²⁰ West Texas Intermediate
- ²¹ Keith Couch, James Glavin and Aaron Johnson, *The Impact of Bitumen-Derived Feeds on the FCC Unit*, Des Plaines, Illinois: UOP LLC, 2008, <http://www.uop.com/objects/AM-08-20%20FCC%20Bitumen%20Processing.pdf> (last accessed January 12, 2011).
- ²² Canadian Association of Petroleum Producers, March 25, 2008, TAN Phase III Project Update, p. 7, http://www.cqqa.com/docs/documents/Projects/TAN_Phase_III/TAN%20Phase%20III%20-%20March%202008.pdf (last accessed January 12, 2011).
- ²³ G. R. Crandall et al., *Oil Sands Products Analysis for Asian Markets*, Purvin & Gertz, Inc., 2005, p. 102, http://www.energy.alberta.ca/Petrochemical/pdfs/products_analysis_asian_markets.pdf (last accessed January 12, 2011).
- ²⁴ "Fluids – Kinematic Viscosities," The Engineering Toolbox, http://www.engineeringtoolbox.com/kinematic-viscosity-d_397.html (last accessed January 12, 2011).
- ²⁵ *West Texas Intermediate*, Environmental Science and Technology Centre, 2010, Oil Properties Database, http://www.etc-cte.ec.gc.ca/databases/OilProperties/pdf/WEB_West_Texas_Intermediate.pdf (last accessed January 12, 2011).
- ²⁶ *Joint Rates, Rules and Regulation Permits applied on Petroleum Products from points in Louisiana to points in Alabama*, Colonial Pipeline Company, 2008, p.3 http://docs.google.com/viewer?la=v&q=cache:AJC0TgFboUJ:www.colpipe.com/pdfs/Supp%25203%2520FERC%252008Conocophillips.xls.pdf+Colonial+pipeline+specifications+temperature+&hl=en&gl=us&pid=bl&cd=ADGEE3gnFL1H5Rhw0672KD07gH93RmUbeEdK0H6Mc5uAaHnIm6mjG4pyrhJ7ZbtUm+6UYUwZYH_h0MY2QGQ4Bdb8g4R6M_mB30tq3ZLdVhB9GXAG-N5uatVh0P2ZgTr_7bapepI8sig-AHIEt5ABD1IC4mXQq-mUgRy4VMb6u6XA (last accessed January 12, 2011).

- ²⁷ "Pipeline Terminology," Shell U. S. Homepage, Shell Oil Company, http://www.shell.us/home/content/usa/products_services/solutions_for_businesses/pipeline/pipeline_america/terminology/ (last accessed January 12, 2011).
- ²⁸ "Pipeline Terminology," Shell U. S. Homepage, Shell Oil Company, http://www.shell.us/home/content/usa/products_services/solutions_for_businesses/pipeline/pipeline_america/terminology/ (last accessed January 12, 2011).
- ²⁹ According to Dennis Haynes at the NPRA, in some of the bitumen-derived crudes, there has been reported solids loading of as much as hundreds of pounds per thousand barrels of crude. Over two hundred pounds of solids per thousand barrels of crude is equivalent to 125 lbs of solids at a rate of 900,000 bpd. *2008 NPRA Q&A and Technology Forum: Answer Book*, Champion's Gate, FL: National Petrochemical and Refiners Association, 2008, Question 50: Desalting, http://www.npra.org/forms/uploadFiles/17C4900000055.filename.2008_QA_Answer_Book.pdf (last accessed January 12, 2011).
- ³⁰ "Portable Pressure Blasting Series," Kramer Industries, Inc., 2011, <http://www.kramerindustriesonline.com/blasting-systems/ppb-series.htm> (last accessed January 12, 2011).
- ³¹ "Pipeline Terminology," Shell U. S. Homepage, Shell Oil Company, http://www.shell.us/home/content/usa/products_services/solutions_for_businesses/pipeline/pipeline_america/terminology/ (last accessed January 12, 2011).
- ³² "Keystone Pipeline, USA," Net Resources International, 2011, http://www.hydrocarbons-technology.com/projects/keystone_pipeline/ (last accessed January 12, 2011); *Draft Environmental Impact Statement for Keystone XL, Appendix L: Pipeline Temperature Effects Study*, U. S. Department of State, 2010. The DEIS and its appendices for Keystone XL can be found via <http://www.keystonepipeline-xl.state.gov>.
- ³³ See, CIRIA, Chemical Storage Tank Systems – Good Practices, p. 204.
- ³⁴ "Expert Viewpoint – Phase Behaviors of Heavy Oils and Bitumen," Schlumberger Ltd., 2011, http://www.heavyoilinfo.com/feature_items/expert-viewpoint-phase-behavior-of-heavy-oils-and-bitumen-with-dr-john-m.-shaw (last accessed January 12, 2011). See also: Changjun Li et al., *Study on Liquid-Column Separation in Oil Transport Pipeline*, ASCE Conf. Proc. 361, p. 54, 2009, <http://ceeb.asce.org/cgi/WWWDisplay.cgi?175441> (last accessed January 12, 2011).
- ³⁵ This phenomenon is known as cavitation. A. I. (Sandy) Williamson, *Degradation Mechanisms in the Oil Sands Industry*, Calgary, Alberta: Ammonite Corrosion Eng. Inc., 2006, Presentation to the National Association of Corrosion Engineers, slide 31, http://www.naceedmonton.com/pdf/FtMacPresentation/Ammonite_Degradation%20Mechanisms%20in%200%20operations_NACE_Fort%20Mac_10%2006.pdf (last accessed January 12, 2011).
- ³⁶ John M. Shaw and Xiang-Yang Zou, "Challenges Inherent in the Development of Predictive Deposition Tools for Asphaltene Containing Hydrocarbon Fluids," *Petroleum Science and Technology*, Vol. 22, Nos. 7 & 8, pp. 773-786, 2004, http://www.uofaweb.ualberta.ca/mshaw/pdfs/2004Challenges_Inherent_in_Development.pdf (last accessed January 12, 2011).
- ³⁷ A. Bergant and A. R. Simpson, "Cavitation in Pipeline Column Separation," 1993, <http://www.iahr.org/membersonly/grazproceedings99/doc/000/000/112.htm> (last accessed January 12, 2011).
- ³⁸ Matthew McCleam, "Enbridge: Under Pressure," *Canadian Business*, December 6, 2010, http://www.canadianbusiness.com/markets/commodities/article.jsp?content=20101206_10023_10023 (last accessed January 12, 2011).
- ³⁹ Deborah Hersman, Chairman of the National Transportation Safety Board, Testimony before Committee on Transportation and Infrastructure, September 15, 2010, <http://www.ntsb.gov/speeches/hersman/daph100915.html> (last accessed January 12, 2011). See also: Matthew McCleam, "Enbridge: Under Pressure," *Canadian Business*, December 6, 2010, http://www.canadianbusiness.com/markets/commodities/article.jsp?content=20101206_10023_10023 (last accessed January 12, 2011). See also: Eartha Jane Melzer, "Pipeline spill underlines fears of new tar sands development," *Michigan Messenger*, August 10, 2010, <http://michiganmessenger.com/40744/pipeline-spill-underlines-fears-of-new-tar-sands-development> (last accessed January 12, 2011). Richard Kuprewicz is quoted in the *Michigan Messenger* as stating that the viscosity of tar sands and the use of diluents create frequent pressure warnings in pipeline monitoring systems, false positives that can make it more difficult to detect a real pressure problem in the pipe which can indicate a leak.
- ⁴⁰ Deborah Hersman, Chairman of the National Transportation Safety Board, Testimony before Committee on Transportation and Infrastructure, September 15, 2010, <http://www.ntsb.gov/speeches/hersman/daph100915.html> (last accessed January 12, 2011).
- ⁴¹ There are numerous cases of pipeline explosions involving NGL condensate, including the January 1, 2011 explosion of a NGL condensate line in northern Alberta ("PENGROWTH investigates pipeline explosion in northern Alberta," *The Globe and Mail*, January 2, 2011, <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/pengrowth-investigates-pipeline-explosion-in-northern-alberta/article1855533/> (last accessed January 12, 2011)); and the 2007 explosion of an NGL pipeline near Fort Worth Texas after it had been ruptured by a third party ("No Injuries In Parker Co. Gas Pipeline Explosion," *AP/CBS 11 News*, 12 May 2007, http://www.kelberginc.com/web_news_files/pipeline-explosion-pr1.pdf (last accessed January 12, 2011)).
- ⁴² "Material Safety Data Sheet: Natural Gas Condensates," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2480179 (last accessed January 12, 2011).
- ⁴³ "Material Safety Data Sheet: Natural Gas Condensate, Petroleum," Oneok, 2009, <http://www.oneokpartners.com/en/CorporateResponsibility/-/media/ONEOK/SafetyDocs/Natural%20Gas%20Condensate%20Petroleum.ashx> (last accessed January 12, 2011).
- ⁴⁴ "Hydrogen Sulfide," Occupational Safety and Health Administration, Fact Sheet, 2005, http://www.osha.gov/DshDoc/data_hurricane_facts/hydrogen_sulfide_fact.pdf (last accessed January 12, 2011); "Material Safety Data Sheet: Dilbit Cold Lake Blend," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2479752 (last accessed January 12, 2011).
- ⁴⁵ *Enbridge Line 66 B08 Pipeline Release, Marshall, Michigan, Health and Safety Plan*, Enbridge, Inc., 2010, http://www.epa.gov/enbridgespill/pdfs/finalworkplanpdfs/enbridge_final_healthsafety_20100619.pdf (last accessed January 12, 2011).
- ⁴⁶ "Material Safety Data Sheet: Dilbit Cold Lake Blend," Imperial Oil, 2002, http://www.msdsxchange.com/english/show_msds.cfm?paramid1=2479752 (last accessed January 12, 2011).
- ⁴⁷ Martha Stanbury et al., *Acute Health Effects of the Enbridge Oil Spill*, Lansing, MI: Michigan Department of Community Health, November 2010, http://www.michigan.gov/documents/mdch/enbridge_oil_spill_epi_report_with_cover_11_22_10_339101_7.pdf (last accessed January 12, 2011).
- ⁴⁸ *Toxicological Profile for Polycyclic Aromatic Hydrocarbons*, Agency for Toxic Substances and Disease Registry, 1995, <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=122&tid=25> (last accessed January 12, 2011); Benzene, Agency for Toxic Substances and Disease Registry, 1995, <http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=14> (last accessed January 12, 2011).
- ⁴⁹ "Athabasca Bitumen," Environment Canada, Emergencies Science and Technology Division, http://www.etc-cte.ac.gc.ca/databases/OilProperties/pdf/WEB_Athabasca_Bitumen.pdf (last accessed January 12, 2011).
- ⁵⁰ The bioaccumulation of heavy metals is well established in academic literature (see, for example, R. Vinodhini and M. Narayanan, *Bioaccumulation of heavy metals in organs of fresh water fish Cyprinus carpio (Common carp)*, Int. J. Environ. Sci. Tech, 5 (2), Spring 2008, 179-182, <http://www.ceers.org/ijest/issues/tul/v5/n2/502005.pdf> (last accessed January 12, 2011)). Heavy metals are elemental in nature and cannot biodegrade and have a variety of toxic effects ("Toxicological Profiles," Agency for Toxic Substances and Disease Registry, 2010, <http://www.atsdr.cdc.gov/toxprofiles/index.asp> (last accessed January 12, 2011)).
- ⁵¹ "Oil Spill Response Techniques," EPA Emergency Management, Environmental Protection Agency, 2009, <http://www.epa.gov/oem/content/learning/oiltech.htm> (last accessed January 12, 2011).

- ⁵² *The Northern Great Plains at Risk: Oil Spill Planning Deficiencies in Keystone Pipeline System*; Plains Justice, 2010, p. 7, http://plainsjustice.org/files/Keystone_XL/Keystone%20Pipeline%20Oil%20Spill%20Response%20Planning%20Report%202010-11-23%20FINAL.pdf (last accessed January 12, 2011).
- ⁵³ *Understanding Oil Spills and Oil Spill Response*, Environmental Protection Agency, 2009, Chapter 2: Mechanical Containment and Recovery of Oil Following a Spill, http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap2.pdf (last accessed January 12, 2011).
- ⁵⁴ Id.
- ⁵⁵ *The Northern Great Plains at Risk: Oil Spill Planning Deficiencies in Keystone Pipeline System*; Plains Justice, 2010, p. 1, http://plainsjustice.org/files/Keystone_XL/Keystone%20Pipeline%20Oil%20Spill%20Response%20Planning%20Report%202010-11-23%20FINAL.pdf (last accessed January 12, 2011).
- ⁵⁶ Id.
- ⁵⁷ *The Northern Great Plains at Risk: Oil Spill Planning Deficiencies in Keystone Pipeline System*; Plains Justice, 2010, p. 61, http://plainsjustice.org/files/Keystone_XL/Keystone%20Pipeline%20Oil%20Spill%20Response%20Planning%20Report%202010-11-23%20FINAL.pdf (last accessed January 12, 2011).
- ⁵⁸ Id.
- ⁵⁹ *The Northern Great Plains at Risk: Oil Spill Planning Deficiencies in Keystone Pipeline System*; Plains Justice, 2010, pp. 28-29, http://plainsjustice.org/files/Keystone_XL/Keystone%20Pipeline%20Oil%20Spill%20Response%20Planning%20Report%202010-11-23%20FINAL.pdf (last accessed January 12, 2011).
- ⁶⁰ To collect and compile the Alberta pipeline data, NRDC contracted the consulting firm Visible Data, Inc., of Calgary, Alberta, which provided the data for ERCB's 2007 Pipeline Performance in Alberta, 1990-2005 Report (<http://www.ercb.ca/docs/documents/reports/r2007-a.pdf>) using ERCB's Pipeline Incidents Data. The firm collected data of spills greater than or equal to 26.3 gallons for crude, multiphase, and other pipelines, spills greater or equal to 26.3 gallons attributed to internal corrosion for crude, multiphase and other pipelines, and pipeline mileage data between 2002 and 2010.
- ⁶¹ The use of dedicated DIBit pipelines is a recent development in the United States. The first dedicated DIBit pipeline in the United States, the Alberta Clipper, did not begin operation until April 2010.
- ⁶² Unconventional tar sands constituted 69 percent of Alberta's production in 2009. A portion of this was transported as DIBit to upgraders in Alberta and the rest was exported as DIBit to refineries elsewhere in Canada and in the United States. Energy Resources Conservation Board, *Alberta's Energy Reserves 2009 and Supply/Demand Outlook, 2010-2019*, June 2010, p. 2-18, http://www.ercb.ca/docs/products/STs/st98_current.pdf (last accessed January 12, 2011).
- ⁶³ Alberta's pipeline system increased from 49,597 km in 1990 (Alberta Energy and Utilities Board, *Pipeline Performance in Alberta, 1990-2005*, April 2007, p. 7, <http://www.ercb.ca/docs/documents/reports/r2007-a.pdf> (last accessed January 12, 2011)) to 105,555 km in 2010 (Visible Data, ERCB Database, January 7, 2011).
- ⁶⁴ PHMSA, 2009 Hazardous Liquid Data, cited in Pipeline Safety Trust, <http://www.pstrust.org/ageoiliquidpipelines.htm> (last accessed January 12, 2011).
- ⁶⁵ In the Alberta system, 1257 of 2705 spills resulting in releases greater than 26.3 gallons between 2002 and 2010 were attributed to internal corrosion. This number does not include spills attributed to external corrosion, stress cracking corrosion, hydrogen stress cracking or unknown causes. This constitutes 46.5 percent of all spills on the Alberta system between 2002 and 2010. Data provided by Visible Data Inc. using ERCB's incident database on January 7, 2011. The U.S. pipeline system had 222 spills resulting in releases greater than 26.3 gallons attributed to internal corrosion. PHMSA, Distribution, Transmission, and Liquid Accident and Incident Data, January 1, 2002 through December 31, 2010, <http://www.phmsa.dot.gov/portal/site/PHMSA/menuitem.ebdc7a8a7e39f2e55c7031050248a0c/?vgnextoid=fdd2dfa122a1d110VgnVCM100009ed07896RCHD&vgnextchannel=3430b649a2dc110VgnVCM100009ed07896RCHD&vgnexttm=print> (last accessed January 12, 2011). This constitutes 8.9 percent of all spills greater than 26.3 gallons on the U.S. system between 2002 and 2010.
- ⁶⁶ Much of the information for this table comes from: *Staying Hooked on a Dirty Fuel: Why Canadian Tar Sands Are a Bad Bet for the United States*, National Wildlife Federation, 2010, pp. 10-11, http://www.nwfw.org/News-and-Magazines/Media-Center/Reports/Archive/2010/-/media/PDFs/Global%20Warming/Reports/NWF_TarSands_final.ashx (last accessed January 12, 2011).
- ⁶⁷ "Why is this important?" National Oceanic and Atmospheric Administration, Center of Excellence for Great Lakes and Human Health, <http://www.glerl.noaa.gov/res/Centers/HumanHealth/> (last accessed January 12, 2011).
- ⁶⁸ "Lakehead System," Enbridge U. S. Operations, Enbridge, 2011, <http://www.enbridgeus.com/Main.aspx?id=210&tmi=210&tme=1> (last accessed January 12, 2011). "Enbridge Pipelines System Configuration Quarter 4, 2010," Enbridge, 2010, <http://www.enbridge.com/DeliveringEnergy/OurPipelines/-/media/Site%20Documents/Delivering%20Energy/2010%20Q4%20Pipeline%20System%20Configuration.ashx> (last accessed January 12, 2011).
- ⁶⁹ "Replacing River Pipeline Is a Victory," *The Times Herald*, 2010, <http://www.thetimesherald.com/article/20101229/OPINION01/12290320/Replacing-river-pipeline-is-a-victory> (last accessed January 12, 2011).
- ⁷⁰ "Indiana Dunes," National Park Service, 2011, <http://www.nps.gov/indu/index.htm> (last accessed January 12, 2011).
- ⁷¹ "Deep Fork National Wildlife Refuge," U. S. Fish and Wildlife Service, <http://www.fws.gov/refuges/profiles/index.cfm?id=21592> (last accessed January 12, 2011).
- ⁷² "Topeka Shiner (Notropis topeka)," U. S. Fish and Wildlife Service, 2011, <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E07R> (last accessed January 12, 2011).
- ⁷³ Gary L. Krapu, Sandhill Cranes and the Platte River, pp. 103-117 in K. P. Able, ed., *Gatherings of Angels*, Chapter 7, Ithaca, NY: Cornell University Press, 1999, Jamestown, ND: Northern Prairie Wildlife Research Center Online, <http://www.npwr.usgs.gov/resource/birds/sndcrane/index.htm> (last accessed January 12, 2011).
- ⁷⁴ "Prairie Pothole Region: Level I Ducks Unlimited conservation priority area, the most important and threatened waterfowl habitat in North America," Ducks Unlimited, <http://www.ducks.org/conservation/prairie-pothole-region> (last accessed January 12, 2011).
- ⁷⁵ "Endangered and Threatened Wildlife and Plants: Listing the Mountain Plover as Threatened," Department of the Interior Fish and Wildlife Service, 2010, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2010_register&docid=f23jr10-24 (last accessed January 12, 2011).
- ⁷⁶ "Pronghorn — *Antilocapra americana*," Montana Field Guide, Montana Natural Heritage Program and Montana Fish, Wildlife and Parks, http://FieldGuide.mt.gov/detail_AMALD01010.aspx (last accessed January 12, 2011).
- ⁷⁷ "Upper Missouri River Breaks National Monument," U. S. Department of Interior Bureau of Land Management, 2010, http://www.blm.gov/mt/st/en/fo/lewistown_field_office/umbnrm.html (last accessed January 12, 2011).
- ⁷⁸ "About YRDC: History," Yellowstone River Conservation District Council, 2010, <http://www.yellowstonerivercouncil.org/about.php> (last accessed January 12, 2011).
- ⁷⁹ "EPA Response to Enbridge Spill in Michigan," United States Environmental Protection Agency, 2010, <http://www.epa.gov/enbridgespill/> (last accessed January 12, 2011).
- ⁸⁰ "Interior Least Tern (*Sterna anillarum athalassae*)," Texas Parks and Wildlife, 2009, <http://www.tpwd.state.tx.us/huntwild/wild/species/leasttern/> (last accessed January 12, 2011).
- ⁸¹ Draft Environmental Impact Statement for the Keystone XL Oil Pipeline Project, U. S. Department of State, 2010, p. 3.3-18.



**Natural Resources
Defense Council**
40 West 20th Street
New York, NY 10011
212 727-2700
Fax 212 727-1773
www.nrdc.org



National Wildlife Federation
11100 Wildlife Center Drive
Reston, VA 20190
703 438-6000
www.nwf.org



Pipeline Safety Trust
1155 N. State St., Suite 609
Bellingham, WA 98225
360 543-5686
www.pstrust.org



Sierra Club
85 Second Street, 2nd Floor
San Francisco, CA 94105
415 977-5500
Fax 415 977-5799
www.sierraclub.org

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

**Comments to the Office of Pipeline Safety
In response to the Advanced Notice of Proposed
Rulemaking Titled “Safety of On-Shore Hazardous
Liquid Pipelines”**

Submitted February 18, 2011

Submitted via the Federal eRulemaking Portal

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

February 18, 2011

Jeffrey D. Wiese
Associate Administrator for Pipeline Safety
U.S. Department of Transportation
c/o U.S. DOT Docket Management System
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue SE
Washington, DC 20590-0001
<http://www.regulations.gov>

**Re: Comment in response Advanced Notice of Proposed Rulemaking (ANPRM) on
safety of on-shore hazardous liquid pipelines**

Dear Mr. Wiese,

On behalf of the Natural Resources Defense Council, Sierra Club, National Wildlife Federation, Plains Justice, Western Organization of Resource Councils and Dakota Resource Council, we submit the following comments on the Advance Notice of Proposed Rulemaking (ANPRM) on the safety of on-shore hazardous liquid pipelines.¹

A series of disasters have increased the information available to the public regarding the potential impacts of diluted bitumen on hazardous liquid pipelines. A recent pipeline spill of over 840,000 gallons of diluted bitumen into the Kalamazoo River in Michigan has demonstrated some of the risks associated with transporting highly corrosive, acidic and potentially unstable diluted bitumen in pipelines. These concerns have been intensified by the rapid increase of diluted bitumen imports into the United States, a recent analysis of the corrosive characteristics of diluted bitumen in high temperature pipelines, and a recent finding that the Alberta hazardous liquid pipeline system, which carries the greatest volume of diluted bitumen in North America, had over sixteen times more spills greater than 26 gallons due to internal corrosion between 2002-2010 than the U.S. pipeline system.²

In the comments below, we outline the need for additional regulations to mitigate the risks of the pipeline transport of diluted bitumen, a broadened definition for "High Consequence Areas," revised regulations to address leak detection challenges associated with diluted bitumen, and the clarification of stress corrosion cracking regulations.

¹ 75 Federal Register 63774 ff., October 18, 2010.

² Swift, Anthony, Susan Casey-Lefkowitz, Elizabeth Shope, *Tar Sands Pipelines Safety Risks*, Natural Resources Defense Council, National Wildlife Federation, Pipeline Safety Trust, Sierra Club, February 2011. <http://www.nrdc.org/energy/files/tarsandssafetyrisks.pdf>

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

We recommend that the Pipeline and Hazardous Materials Safety Administration promulgate rules and standards to establish design specifications, integrity management and corrosion controls to mitigate the increased risks associated with diluted bitumen pipelines.

1. Scope of pipeline safety regulations. PHMSA should establish additional safety standards for diluted bitumen (DilBit) pipelines. (In response to PHMSA Question A.2)

The Department of Transportation should analyze and address the potential risks associated with the transport of diluted bitumen at the high temperatures and pressures at which those pipelines operate and put new regulations in place as necessary to address these risks.

i. Characteristics of diluted bitumen

There are many indications that diluted bitumen is significantly more corrosive to pipeline systems than conventional crude. Bitumen blends are more acidic, thick, and sulfuric than conventional crude oil.³ DilBit contains fifteen to twenty times higher acid concentrations than conventional crudes and five to ten times as much sulfur as conventional crudes.⁴ It is up to seventy times more viscous than conventional crudes.⁵ The additional sulfur can lead to the weakening or embrittlement of pipelines.⁶ DilBit also has high concentrations of chloride salts which can lead to chloride stress corrosion in high temperature pipelines.⁷ Refiners have found tar sands derived crude to contain significantly higher quantities of abrasive quartz sand particles than conventional crude.⁸

³ Gareth Crandall, *Non-Conventional Oil Market Outlook*, Presentation to: International Energy Agency, Conference on Non-Conventional Oil, 2002, p. 4, <http://www.iea.org/work/2002/calgary/Crandall.pdf>, last accessed 12 Feb. 2011; *Canadian Crude Quick Reference Guide Version 0.54*, Crude Oil Quality Association, 2009, <http://www.coqa-inc.org/102209CanadianCrudeReferenceGuide.pdf>, last accessed 12 Feb. 2011.

⁴ *Canadian Crude Quick Reference Guide Version 0.54*, Crude Oil Quality Association, 2009, <http://www.coqa-inc.org/102209CanadianCrudeReferenceGuide.pdf>, last accessed 12 Feb. 2011.

⁵ *Id.*

⁶ William Lyons and Gary Plisga, *Standard Handbook of Petroleum and Natural Gas Engineering*, Burlington, MA: Gulf Professional Publishing, 2005, p. 4-521.

⁷ *Planning Ahead for Effective Canadian Crude Processing*, Baker Hughes, 2010, p. 4, http://www.bakerhughes.com/assets/media/whitepapers/4c2a3c8ffa7e1c3c7400001d/file/28271-canadian_crudeoil_update_whitepaper_06-10.pdf.pdf&fs=1497549, last accessed 12 Feb. 2011; A. I. (Sandy) Williamson, *Degradation Mechanisms in the Oilsands Industry*, Calgary, Alberta: Ammonite Corrosion Eng. Inc., 2006, Presentation to the National Association of Corrosion Engineers, slide 27, http://www.naceedmonton.com/pdf/FtMacPresentation/Ammonite_Degradation%20Mechanisms%20in%20OOS%20Operations_NACE_Fort%20Mac_10%2006.pdf, last accessed 12 Feb. 2011.

⁸ *2008 NPRA Q&A and Technology Forum: Answer Book*, Champion's Gate, FL: National Petrochemical and Refiners Association, 2008, Question 50: Desalting, http://www.npra.org/forms/uploadFiles/17C4900000055.filename.2008_QA_Answer_Book.pdf, last accessed 12 Feb. 2011.

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

This combination of chemical corrosion and physical abrasion can dramatically increase the rate of pipeline deterioration.⁹

Temperature and chemical interactions: The risks of corrosion and the abrasive nature of DilBit are made worse by the relatively high heat and pressure at which these pipelines are operated in order to move the thick DilBit through the pipe. Due to the high viscosity or thickness of DilBit, pipelines operate at pressures up to 1440 psi and at temperatures up to 158 degrees Fahrenheit.¹⁰ Higher temperatures thin the DilBit and increase its speed through the pipeline. They also increase the speed at which acids and other chemicals corrode the pipeline. An accepted industry rule of thumb is that the rate of corrosion doubles with every 10 degree Celsius increase in temperature.¹¹ At high temperatures, the mixture of light, gaseous condensate, and thick, heavy bitumen, can become unstable.¹²

Multiphase properties of diluted bitumen: In addition, diluted bitumen blends have been shown to exhibit multiphase behavior, or variations caused as fractions of natural gas liquids transition into the gas phase during the liquid transport of the diluted bitumen.¹³ Variations in pipeline pressure can cause the natural gas liquid condensate to change from liquid to gas form. This creates gas bubbles within the pipeline. When these bubbles form and collapse they release bursts of high pressure that can deform pipeline metal.¹⁴ The instability of DilBit can render pipelines particularly susceptible to ruptures caused by pressure spikes.¹⁵

⁹ Henry Liu, *Pipeline Engineering*, Boca Raton, FL: CRC Press LLC, 2003, p. 317, http://books.google.com/books?id=v_THSIAdx60C&pg=PA317&lpg=PA317&dq=erosion+corrosion+pipeline&source=bl&ots=GLwldWcqyv&sig=jaYy3OrfxaoKGD3d0vCkt2oem6E&hl=en&ei=5UQjTcLhOcGC8gbw8KzRCA&sa=X&oi=book_result&ct=result&resnum=9&ved=0CFYQ6AEwCA#v=onepage&q=erosion%20corrosion%20pipeline&f=false, last accessed 12 Feb. 2011.

¹⁰ "Keystone Pipeline, USA," Net Resources International, 2011, http://www.hydrocarbons-technology.com/projects/keystone_pipeline/, last accessed 12 Feb. 2011. *Draft Environmental Impact Statement for Keystone XL, Appendix L: Pipeline Temperature Effects Study*, U. S. Department of State, 2010. The DEIS and its appendices for Keystone XL can be found via <http://www.keystonepipeline-xl.state.gov>.

¹¹ See, CIRIA, *Chemical Storage Tank Systems – Good Practices*, page 204.

¹² "Expert Viewpoint – Phase Behaviors of Heavy Oils and Bitumen," Schlumberger Ltd., 2011, http://www.heavyoilinfo.com/feature_items/expert-viewpoint-phase-behavior-of-heavy-oils-and-bitumen-with-dr-john-m-shaw, last accessed 12 Feb. 2011. See also: Changjun Li et al., *Study on Liquid-Column Separation in Oil Transport Pipeline*, ASCE Conf. Proc. 361, 54, 2009, <http://cedb.asce.org/cgi/WWWdisplay.cgi?175441>, last accessed 12 Feb. 2011.

¹³ http://www.uofaweb.ualberta.ca/jmshaw/pdfs/2004Challenges_Inherent_in_Development.pdf

¹⁴ This phenomenon is known as cavitation. A. I. (Sandy) Williamson, *Degradation Mechanisms in the Oilsands Industry*, Calgary, Alberta: Ammonite Corrosion Eng. Inc., 2006, Presentation to the National Association of Corrosion Engineers, slide 31, http://www.naceedmonton.com/pdf/FtMacPresentation/Ammonite_Degradation%20Mechanisms%20in%20OS%20Operations_NACE_Fort%20Mac_10%2006.pdf, last accessed 12 Feb. 2011.

¹⁵ John M. Shaw and Xiang-Yang Zou, "Challenges Inherent in the Development of Predictive Deposition Tools for Asphaltene Containing Hydrocarbon Fluids," *Petroleum Science and Technology*, Vol. 22, Nos. 7 & 8, pp. 773-786, 2004, http://www.uofaweb.ualberta.ca/jmshaw/pdfs/2004Challenges_Inherent_in_Development.pdf, last accessed 12 Feb. 2011.

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

ii. Weaknesses in current regulations

Addressing these risks may require a variety of changes in the design, operation and corrosion control practices for these pipelines. The Technical Hazardous Liquid Pipeline Safety Standard Committee (THLPSSC) should review of CFR § 195 and promulgate rules which will address the risks presented by diluted bitumen pipelines. Regulations which may not address the specific risks of diluted bitumen pipelines include but are not limited to:

Temperature: Hazardous liquid pipeline regulations do not address the effect which temperature has on chemical interactions between the product and pipeline materials. The only reference to temperature is CFR §195.102, which states that “materials for components of the system must be chosen for the temperature environment in which the components will be used so that the pipeline will maintain its structural integrity.” While the requirement to build pipelines with materials appropriate for their temperature environment is necessary, it may not be sufficient.

Because high pipeline temperatures can substantially increase the speed and number of corrosive chemical interactions that take place within the pipeline, regulations should address the construction, design, and operation of high temperature pipelines.

Internal Corrosion: Hazardous liquid regulations for internal corrosion on pipelines outside high consequence areas are limited to CFR §195.579 which requires that pipeline operators that transport corrosive hazardous liquids “investigate the corrosive effect of the hazardous liquid or carbon dioxide on the pipeline and take adequate steps to mitigate internal corrosion.” The regulation needs to be updated to reflect the dangers that increasing volumes of acidic, corrosive diluted bitumen pose to the U.S. pipeline system.

PHMSA should assess synergistic risks of high temperature, high pressure, high Total Acid Number (TAN), high sulfur content, high bottom, sediment and water (BS&W) content, and the multiphase properties of diluted bitumen on pipeline integrity and promulgate rules and standards to establish design specifications, integrity management and corrosion controls to mitigate increased risks in these lines.

**2. The definition of “High Consequence Areas” (HCAs) should be expanded.
(In response to PHMSA Question B.1)**

A particularly troubling aspect of the current pipeline safety regulation is its narrow definition of “High Consequence Areas” (“HCAs”). An area designated as an HCA gets increased protection through the Integrity Management Program. Regulations currently exclude the vast majority of hazardous liquid pipelines in the United States, which as a result do not receive adequate monitoring and inspections. We urge PHMSA to consider an expansion of integrity management requirements so they cover all oil transmission pipelines.

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

In addition, we urge PHMSA to adopt a broader HCA that will protect more areas traversed by pipelines throughout the United States. We lay out specific recommendations for improving each of the HCA definition components below.

i. The threshold defining High Population Areas should be lowered to include more cities and towns.

The current regulations protect “high population areas,” which are defined as areas with 50,000 or more people and a population of at least 1,000 people per square mile, as defined and delineated by the Census Bureau.¹⁶ These population and density thresholds should be lowered. The dangers associated with pipeline spills, explosions, and other accidents are high. All precautionary measures should be taken to protect populated areas from these types of accidents, including the inspection and integrity procedures required in HCAs. It makes little sense to place an arbitrary numerical threshold determining whether a pipeline operator actively engage in an integrity management program to insure the safety of its pipeline. As regulations now stand, integrity management plans are required for pipelines running under a city of 55,000 people and fail to similarly protect a city of 45,000 people. Moreover, that city of 55,000 may not qualify for protection if it has a population density of slightly less than 1,000 people per square mile. These numbers should be eliminated altogether and replaced with a distance requirement. Areas with even a few families deserve to be protected from hazardous liquid pipeline accidents. Thus, the definition of HCAs should include less populated areas along pipeline routes.

ii. The definition of other populated areas should be expanded.

The definition of HCAs also includes “other populated areas,” which are concentrated populations, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area.¹⁷ Again, these terms are defined and delineated by the Census Bureau.

While this provision would seem to protect some areas that are not covered by the “high population area” provision, the combination of the two provisions appears to allow some areas to fall through the cracks and remain unprotected. For example, there appears to be a “concentration” requirement in this provision as well, which means that sparsely populated residential areas like ranches, farms, and some neighborhoods, could fail to be protected despite the presence of a relatively large amount of people.

This provision should be amended, along with the “high population area” provision, to protect all residential and commercial areas.

iii. The definition of “unusually sensitive areas” should be amended to provide more protection.

¹⁶ 49 C.F.R. § 195.450(2).

¹⁷ 49 C.F.R. § 195.450(3).

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

The definition of HCA also includes “unusually sensitive areas” (or “USAs”) as defined in 49 C.F.R. § 195.6.¹⁸ This regulation provides protection to some important areas, but is woefully inadequate and seems to provide protection only to places where a liquid pipeline spill would result in permanent or long-lasting damage.¹⁹ The regulations omit many areas that are environmentally sensitive, and should be amended to protect additional sensitive areas as explained in more detail here.

Water supply systems for communities should be afforded greater protection. Fresh water is becoming increasingly scarce and should be protected. The current regulations do not protect water intakes for surface water community systems if there is an alternative supply that could supply the community for a month.²⁰ As demonstrated by the still-ongoing Kalamazoo River clean-up, the response and restoration of a large hazardous liquid pipeline spill can take far longer than a month, closing waterways up to a year and sometimes longer.²¹ Similarly, the definition of USAs excludes other important water resources such as individual or private drinking water wells and all aquifer recharge areas other than karst aquifers.²²

All of these water resources are important to the nearby communities, and should be protected as HCAs. It is inequitable to require pipeline operators to maintain and inspect only the hazardous liquid pipelines where a spill would be catastrophic to local communities; but avoid the same obligations where a spill would merely destroy a community’s primary water supply, or only leave some families without clean drinking water. The definition of HCAs should be amended so that all areas of pipelines near drinking water supplies are considered USA drinking water resources.

The definition of HCAs is also inadequate to protect ecological resources. Under the current regulations, for example, species listed as threatened or endangered under the Endangered Species Act (“ESA”) are only protected under very limited circumstances. An area in which an ESA-listed species is found is only considered an HCA if it meets a very high standard—that species must be “critically imperiled,” or a species of “extreme rarity” according to a ranking system put together by The Nature Conservancy.²³ The threshold that a species must meet to warrant protection appears to be five or fewer populations or 1000 or fewer individuals worldwide.²⁴ The purpose of the ESA is to promote not just the survival, but the recovery of threatened and endangered species. The current regulations allow operators to avoid the highest degree of care in the operation of pipelines unless a spill would potentially threaten the continued existence of a species.

¹⁸ 49 C.F.R. § 195.450.

¹⁹ Carol M. Parker, Primer on Pipeline Safety Laws and Regulations (Sept. 5, 2004), available at http://pstrust.org/library/docs/pipeline_safety_regs_primer.pdf

²⁰ *Id.*; 49 CFR 195.6(a)(1).

²¹ <http://michiganmessenger.com/46552/epa-kalamazoo-river-to-remain-closed-all-summer>

²² 49 CFR 195.6(a), (a)(3).

²³ 49 C.F.R. § 195.6(b)(1)-(2).

²⁴ 49 C.F.R. § 195.6(b)(1)-(2).

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

This is inconsistent with the congressional intent of promoting the recovery of threatened and endangered species under the ESA.

The regulations are also inadequate in their protection of migratory birds. The definition of USA ecological resources appears to exclude all but about 50 specific sites in the U.S. Specifically, the definition includes only “migratory waterbird concentration areas,” which includes only Ramsar sites²⁵ (of which there are 19 nationwide) and Western Hemisphere Shorebird Reserve sites²⁶ (of which there are 38 nationwide).²⁷ This component of the HCA definition should be strengthened to protect additional areas that are crucial to migratory birds to better reflect the meaning and intent of the Migratory Bird Treaty Act.²⁸

Also, there are no provisions within the definition of HCAs that provide protection to some of our most highly treasured national landmarks: national parks, wild and scenic rivers, estuaries, wilderness areas, and wildlife refuges. Congress specifically instructed that “[w]hen describing areas that are unusually sensitive to environmental damage if there is a hazardous liquid pipeline accident, the Secretary *shall consider* areas where a pipeline rupture would likely cause permanent or long-term environmental damage, including... national parks, wilderness areas, wildlife preservation areas or refuges, wild and scenic rivers... or critical habitat areas for threatened and endangered species.”²⁹ The revenue stream generated by the entrance fees and permit fees from these resources alone are enough to justify greater protection from hazardous liquid pipeline accidents.

3. The phrase “commercially navigable waterway” should be amended to protect more U.S. waterways. (In response to PHMSA Question B.3)

High Consequence Areas only include “commercially navigable waterways,” which are defined as waterways “where a substantial likelihood of commercial navigation exists.” The current regulations seem to reflect an antiquated view of our nation’s water resources and the vital roles that they play. While commercial navigation of our nation’s waterways remains an important function, our uses of freshwater resources have become increasingly complex and our understanding of the ecosystem services provided by hydrological systems has evolved immensely. In short, commercially navigable waterways are not necessarily the only water resources that are deserving of enhanced protection.

The amended pipeline safety regulations should protect wetlands by including them within the definition of HCAs. Congress specifically directed PHMSA to consider wetlands as HCAs in the regulations, but they are inexplicably excluded.³⁰ Wetlands

²⁵ www.wetlands.org/RSDB/default.htm

²⁶ www.manomet.org/WHSRN/sites.php

²⁷ 49 C.F.R. § 195.6(b)(3).

²⁸ 16 U.S.C. § 703.

²⁹ 49 U.S.C.A. § 60109.

³⁰ 49 U.S.C.A. § 60109(b)(2).

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

provide numerous benefits, including but not limited to surface and subsurface water storage; nutrient cycling; particulate removal; plant and animal habitat; flood control; and groundwater recharge.³¹ The economic benefits attributable to the ecosystem services provided by wetlands systems are quantifiable. For example, Louisiana's marshes alone produce several hundred million dollars worth of shellfish harvest annually.³² Hunting, fishing, bird-watching, and photographing wildlife in and around wetlands adds tens of millions of dollars to the U.S. economy annually.³³ Wetlands remove sediment and toxic substances and remove or filter excess nutrients from the water supply, and the cost of building a single water treatment plant to replace an area of wetlands would run into the tens of millions of dollars.³⁴ These are all quantifiable economic benefits of wetlands that, when added nationally, surely total untold billions of dollars. The cost of operating safer pipeline systems to protect these resources pales in comparison.

Moreover, the current definition of HCAs excludes many waterways that are important recreational and tourist sites. For example, the Colorado River, Lake Mead, and Lake Powell are all incredibly important economic drivers in the form of tourism revenue, yet none are considered "commercially navigable waterways."³⁵ In fact, there is not a single "commercially navigable waterway" in New Mexico, Arizona, Colorado, Nevada, Utah, North Dakota, South Dakota or Wyoming.³⁶ The new regulations should be broadened to protect more of these areas from pipeline spills.

As the U.S. population continues to increase, fresh water is becoming increasingly scarce. This is especially so in arid regions of the west and the south. Experts predict that climate change will lead to further reductions in fresh water supply in most regions of the United States.³⁷ This means that fresh water sources for drinking water and agricultural uses will become more and more sought after in the decades to come. Thus, more areas of rivers, streams, lakes, and wetlands should be protected as HCAs.

The Ogallala Aquifer is a good example of an absolutely critical water resource that should be protected as an HCA under the amended regulations. The Ogallala Aquifer, considered one of the great fresh water resources of the world, contains approximately two-thirds of the volume of the High Plains system.³⁸ It covers approximately 225,000 square miles underneath eight states, making it one of the largest aquifer systems in the world.³⁹ The Ogallala aquifer is a vital water source for irrigating U.S. farmland.⁴⁰ The

³¹ http://ncseonline.org/nle/crsreports/wetlands/wet-5.cfm#_1_1

³² <http://www.epa.gov/owow/wetlands/facts/fact4.html>

³³ *Id.*

³⁴ *Id.*

³⁵ Carol M. Parker, Primer on Pipeline Safety Laws and Regulations (Sept. 5, 2004), available at http://pstrust.org/library/docs/pipeline_safety_regs_primer.pdf

³⁶ *Id.*; www.npms.rspa.dot.gov/data/dot_data_cnw.htm.

³⁷ http://www.greatlakeslaw.org/blog/files/Climate_Change_and_Freshwater_Resources.pdf;
<http://www.nrdc.org/globalwarming/west/fwest.pdf>

³⁸ <http://groundwaterfoundation.blogspot.com/2010/06/keystone-xl-pipeline-vs-ogallala.html>

³⁹ <http://www.helium.com/items/438621-depletion-of-the-ogallala-aquifer>

⁴⁰ *Id.*

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

aquifer, however, is extremely porous and transmissive, meaning that a pipeline spill would cause immediate and widespread damage that would be extremely difficult to contain.⁴¹ An open source aquifer such as the Ogallala should be protected as an HCA.

Furthermore, the relatively small percentage of waterways that are commercially navigable includes the much larger rivers and lakes and excludes smaller rivers and streams. However, a hazardous liquid pipeline spill may pose an equal or even greater threat to smaller waterways. For example, a pipeline accident is less likely to be immediately detected on rivers that are less frequented. Also, the complexities of a spill clean-up can be far greater when smaller waterways and wetlands are impacted, because more plants, animals, and aquatic life may be impacted and clean-up crews will have far more difficulty accessing affected areas. Thus, it is illogical for the current regulations to protect only large waterways where spills can be quickly detected and clean-up is relatively straightforward.

For all of these reasons, the amended regulations should delete the phrase “commercially navigable waterways” and replace it with “navigable waters” or “waters of the United States” consistent with the Clean Water Act (“CWA”). The CWA prohibits unpermitted discharges into “navigable waters,” which are defined as “waters of the United States, including the terrestrial seas.”⁴² The Army Corps of Engineers, in turn, broadly defines “waters of the United States” in its CWA regulations as including not just traditionally-navigable waters, but also interstate wetlands and any other intrastate waters, “the use, degradation or destruction of which could affect interstate or foreign commerce.”⁴³ This definition includes “intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds...”⁴⁴ This expansive definition reflects the congressional intent to prevent unpermitted discharges in all of our nation’s waters that can be reached by the Commerce Clause of the U.S. Constitution. Congress obviously recognized that our hydrologic systems are interconnected, that a discharge into one will have far reaching consequences, and that both our health and economic prosperity depend on clean water supplies. The amended pipeline safety regulations should reflect these values and ensure the safety of all hazardous liquid pipelines that could potentially impact our water resources. PHMSA should do this by including all waters of the United States, consistent with the reach of the commerce clause and the CWA, as part of the definition of HCAs.

The importance of classifying more waterways as HCAs was demonstrated last summer, when an aging Enbridge pipeline spilled approximately 840,000 gallons of oil into the Kalamazoo River watershed in Michigan. The official cause of the spill is still under investigation, but experts have speculated that the rupture occurred when the pipe corroded over time. This is exactly the type of defect that a routine inspection under the

⁴¹ <http://groundwaterfoundation.blogspot.com/2010/06/keystone-xl-pipeline-vs-ogallala.html>

⁴² 33 U.S.C. § 1344(a); 33 U.S.C. § 1362(7).

⁴³ 33 CFR § 328.3(a)(3); but see, *Rapanos v. United States*, 547 U.S. 715 (2006) (restricting the reach of the Clean Water Act).

⁴⁴ 33 CFR § 328.3(a)(3).

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

Integrity Management program would have uncovered had it been an HCA. While it remains unknown whether the Kalamazoo River was protected as an HCA (PHMSA does not release this information - see section below), Enbridge's emergency response plans suggest that the Kalamazoo River is not deemed a commercially navigable waterway.⁴⁵

The enormous benefits of extending HCAs to protect our important water resources will unquestionably outweigh the cost to pipeline operators of ensuring the safety of more miles of pipeline. One way to approach this cost-benefit analysis is to examine a specific incident, such as the Enbridge Kalamazoo spill. Enbridge estimated that the cost of cleanup will reach \$550 million, but that estimate excludes any fines and penalties. Furthermore, the total costs are far greater when the long-term environmental and human health impacts are considered.⁴⁶ A conservative estimate of the true cost of the spill is \$600-700 million. The cost of inspecting the areas of Line 6b that are close to water resources for defects on a routine basis, as would be required if the definition of HCAs were expanded would surely be less than \$600 million.

In the Great Lakes region alone, over 30 million people depend on the Great Lakes for their fresh water drinking source, Congress has designated hundreds of millions of dollars towards Great Lakes restoration, and the Great Lakes have an estimated \$7 billion fishing industry. A single oil spill in the Great Lakes would devastate the economy and significantly reduce the value of the nation's investments in this region.

4. The general public and local communities should play a greater role in the identification of HCAs. (In response to PHMSA Question B.5)

Currently there is no opportunity for ongoing public involvement and it is nearly impossible to know whether an area is protected as an HCA. This means that, not only is there no public input into deciding which areas deserve heightened protection, but communities along the pipeline routes do not even know whether an integrity management plan is in place, or in some cases if a pipeline even exists in their community. There are no publicly available comprehensive maps showing where the protection actually is.⁴⁷ The regulations should be greatly improved in this area.

More public involvement is needed in pipeline safety, especially in identifying and overseeing HCAs. The most important way that members of the public can be involved is to undergo a formal rulemaking process and allow public notice and comment. PHMSA should allow state and local governments, community members, non-profits, and any other interested parties to identify which areas are most deserving of added protection.

⁴⁵ Enbridge, Chicago Region Emergency Response Plan.

⁴⁶ <http://www.battlecreekenquirer.com/article/20100818/OILSPILL/8180313/Enbridge-400M-for-oil-cleanup>

⁴⁷ There are, however, some isolated maps, such as those found at <http://www.npms.rspa.dot.gov/>.

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

5. Key issues that new leak detection standards should address. (In response to PHMSA Question C.6)

New leak detection standards should address the additional standards for hazardous liquids which have multiphase properties which cause false alarms. As stated above, as DilBit flows through a pipeline, pressure changes within the pipeline can cause the natural gas liquid condensate component to move from liquid to gas phase.⁴⁸ This forms a gas bubble that can impede the flow of oil. Because this phenomenon—known as column separation—presents many of the same signs as a leak to pipeline operators, real leaks may go unnoticed. Because the proper response to column separation is to pump more oil through the pipeline,⁴⁹ misdiagnoses can be devastating. During the Kalamazoo River spill, the Enbridge pipeline gushed for more than twelve hours before the pipeline was finally shut down and initial investigation indicates that the pipeline's monitoring data were interpreted to indicate a column separation rather than a leak.⁵⁰ Ultimately, emergency responders were not notified until more than nineteen hours after the spill began.⁵¹

PHMSA should revise its regulations so that worst case discharge pumping times are based on historical shutdown times, rather than operator expected times. PHMSA should require full disclosure of worst case discharge calculation methodologies and require that pipeline operators have regular contact with first responders along pipelines. There should also be rules developed that require all pipeline operators to immediately contact first responders at the sight of an issue or problem, warning them of complications. In the case of the Kalamazoo River oil spill, had first responders been notified of alarms, indicating an issue in the Marshall section of pipeline, they would have been able to connect 911 calls – reporting the smell of oil – to a pipeline incident, potentially preventing the oil from reaching the Kalamazoo River and threatening the Great Lakes.

6. Key issues which stress corrosion cracking standards should address. (In response to PHMSA Question F.4)

High sulfur, hot, viscous petroleum products potentially pose high risks for sulfide stress corrosion cracking. The National Association of Corrosion Engineers (NACE) classifies this type of stress corrosion cracking as a catastrophic form of corrosion, as it is very difficult to detect the fine cracks that form in pipeline materials and damage is not easily

⁴⁸ A. Bergant and A. R. Simpson, "Cavitation in Pipeline Column Separation," 1999, <http://www.iahr.org/membersonly/grazproceedings99/doc/000/000/112.htm>, last accessed 12 Feb. 2011.

⁴⁹ Matthew McClearn, "Enbridge: Under Pressure," *Canadian Business*, 6 Dec. 2010, http://www.canadianbusiness.com/markets/commodities/article.jsp?content=20101206_10023_10023, last accessed 12 Feb. 2011.

⁵⁰ Deborah Hersman, Chairman of the National Transportation Safety Board, Testimony before Committee on Transportation and Infrastructure, Sept. 15, 2010, <http://www.nts.gov/speeches/hersman/daph100915.html>, last accessed 12 Feb. 2011.

⁵¹ Deborah Hersman, Chairman of the National Transportation Safety Board, Testimony before Committee on Transportation and Infrastructure, Sept. 15, 2010, <http://www.nts.gov/speeches/hersman/daph100915.html>, last accessed 12 Feb. 2011.

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

predicted.⁵² Stress corrosion cracking may result in an unexpected, disastrous failure with minimal material loss to provide advance warning of its onset.⁵³ NACE recommends that long term mitigation for stress corrosion cracking in pipelines include temperature reduction – a potential remedy PHMSA should consider.⁵⁴

As high sulfur crudes such as diluted bitumen are becoming increasingly common on the U.S. hazardous liquid pipeline system, it is critical that PHMSA promulgate rules and standards which address and mitigate the risks of sulfide stress corrosion cracking on pipelines. While various external coatings are designed to reduce stress corrosion cracking, these coatings should be assessed for their ability to provide protection over the periods that pipelines will be in use and will not degrade after long term exposure to high temperature DilBit pipelines. Additionally, regulations should address mechanisms that would prevent improper application of external pipeline coatings, identification of coating bonding problems and the requirement of redundant stress corrosion cracking measures in the event those problems cannot be entirely addressed.

PHMSA should require an integrity assessment for DilBit pipelines using methods capable of detecting sulfide stress corrosion cracking. The agency should also require a periodic analysis of the effectiveness of operator corrosion management programs, which integrate information about cathodic protection, coating anomalies, in-line inspection data, corrosion coupon data, corrosion inhibitor usage, corrosion inhibitor effectiveness, analysis of corrosion products, and other pertinent information related to corrosion management.

Thank you for taking these concerns into consideration.

Respectfully submitted,

Susan Casey-Lefkowitz
Director International Program
Natural Resources Defense Council
1200 New York Ave, N.W., Suite 400
Washington, D.C. 20005
Phone: 202.289.2366
sclefkowitz@nrdc.org

⁵² National Association of Corrosion Engineers, Resource Center – Corrosion Forms, <http://events.nace.org/library/corrosion/Forms/scc.asp>.

⁵³ *Id.*

⁵⁴ National Association of Corrosion Engineers, Resource Center – Pipeline Stress Corrosion Cracking, <http://events.nace.org/library/corrosion/Forms/scc-pipeline.asp>.

**Natural Resources Defense Council * Sierra Club * National Wildlife Federation
Plains Justice * Western Organization of Resource Councils *
Dakota Resource Council**

Doug Hayes
Project Attorney
Sierra Club Environmental Law Program
1650 38th Street, Suite 102W
Boulder, CO 80301
Phone: 303.449.5595 ext. 100
doug.hayes@sierraclub.org

Corry Westbrook
Legislative Director
National Wildlife Federation
901 E Street NW, Suite 400
Washington, DC 20004
Phone: 202.797.6840
westbrook@nwf.org

Paul Blackburn
Staff Attorney
Plains Justice
P.O. Box 251
Vermillion, SD 57069
Phone: 605.659.0298
pblackburn@plainsjustice.org

John Smillie
Campaign Director
Western Organization of Resource Councils
220 South 27th Street
Billings, MT 59101
Phone: 406.252.9672
jsmillie@worc.org

Mark Trechock
Staff Director
Dakota Resource Council
PO Box 1095
Dickinson, ND 58602-1095
Phone: 701.483.2851
mark@drcinfo.com

Please note that the numbering in this version has been changed from the numbering in our original submission to be sequential (1-6), rather than numbered by PHMSA Question (A.2, B.1, etc.). The PHMSA Question to which each section is responding is still referenced in the headings.

Mr. WHITFIELD. Mr. Swift, thanks very much.

And at this time, I would like to recognize the ranking member, Mr. Rush, for his opening statement.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman, and I want to thank all of the panelists for being here today.

Mr. Chairman, I find it curious that this subcommittee is holding the hearing on pipeline safety after the majority pushed through a bill to cut out the review period for public and agency input in order to influence the administration to hastily come to a decision regarding the Keystone XL pipeline on behalf of the TransCanada Corporation. Yes, this is the same TransCanada Corporation who built the original Keystone pipeline that was temporarily shut down following two leaks on a line that had only been in operation for less than 12 months.

I might seriously question on which side the majority falls when it comes to actually ensuring pipeline safety versus accommodating the interests of corporate entities. So forgive me if it seems like this hearing is a day late and a dollar short when it comes to this subcommittee actually putting into practice whatever lessons we may learn here today. And it appears doubtful that the majority will allow safety concerns to interfere in the weighing of industry moving forward at all costs.

Let it be said I am not opposed to industry but industry's pathway forward must not be oiled by this subcommittee. With that being said, I still believe that this hearing is warranted and necessary and I am pleased to have heard some of the testimony from our distinguished experts and our witnesses on the panel.

Mr. Chairman, in the past, pipeline safety has been an issue that this subcommittee has addressed in a bipartisan fashion. And despite yesterday's markup forcing a hasty decision on the Keystone XL pipeline, I hope that we will continue in that tradition in this session as well. In light of recent pipeline accidents, including Keystone 1 leaks, the PG&E explosion in San Bruno, California, the 2 Enbridge fails in Marshall, Michigan and Romeo, Illinois and the Allentown gas line explosion in Pennsylvania, it is extremely important that we learn from these cases so lessons can be applied to our overall pipeline safety standards.

I look forward to this hearing and I look forward to asking questions of these witnesses. And I look forward to asking questions of the Pipeline Hazardous Materials and Safety Administration on their updated plans for safety transporting tar sands crude from Canada through the heart of the United States, including my State. These tar sands contain bitumen, a heavy, tar-like substance which, compared to conventional crude, has higher sulfur content, higher chloride salt content, and higher quantities of emergent particles, all of which increases the potential for corrosion.

I will also like to hear and ask questions on how PHMSA plans to address the issue of companies using substandard steel for their pipelines that do not comply with industry standards and in many cases leads to stretching and leakage. At a time when Congress and the administration is considering approval of one of the largest

new pipeline projects in recent history, the Keystone XL, which will carry Canada tar sands through the middle of the country, it is imperative that we examine these important issues and assure the American people that we have an effective and comprehensive plan in place to both prevent future spills as well as to deal with accidents once they take place.

So, Mr. Chairman, I look forward to the questioning part of this hearing, and I yield back the balance of my time.

Mr. WHITFIELD. Thank you, Mr. Rush. And I will recognize myself for the purpose of 5 minutes of questions.

Ms. Quarterman, and in fact for all the panel members, all of you, I am sure, are familiar with the Senate bill that has been working on over there. Would each one of you give me your succinct analysis of one or two of the major flaws of that legislation or areas that should have been covered that is not in the bill? Ms. Quarterman?

Ms. QUARTERMAN. Yes, thank you. The administration has not had an opportunity to come forward with an administration position on that particular bill. We have in my testimony today several administration proposals that the administration has been supportive of in the past. I don't know of anything in that bill that is necessarily a showstopper from our vantage point.

Mr. WHITFIELD. But is there any major item that they failed to cover?

Ms. QUARTERMAN. I don't believe there is.

Mr. WHITFIELD. Mr. Black?

Mr. BLACK. No major flaws, Chairman Whitfield. AOPL and API supported the bill moving out of the committee. We hope the Senate will move it without change and then work with the Congress as it considers its bill. We would like the Congress to go further on damage prevention eliminating more—

Mr. WHITFIELD. On damage prevention?

Mr. BLACK. Damage prevention, exemptions from the one-call system in the States. We believe PHMSA should use its authority and Congress should encourage PHMSA to do it or direct it to eliminate more mechanized exemptions than S-275 does now. They added an amendment on due process protections. We think they should go a little further on hearings after issuance of a corrective action order and requiring a separation of functions in PHMSA's staff.

And one more issue that is in the testimony on leak detection, there is a requirement for a study on leak detection technologies which is very complex. We think that is fine. We know PHMSA recently studied this I think in 2007. But there is an assumption that PHMSA must do a rulemaking even before knowing what the study suggested. We think that should be changed to permissive authority to do the rulemaking on leak detection, first a study and figure out if there something more that should be done.

Mr. WHITFIELD. OK. Thank you, Mr. Weimer?

Mr. WEIMER. Yes, we are pretty pleased with Senate Bill 275. It is comprehensive. It covers a number of the issues we have. There are a few things that we think could be done better.

There is a need for fees for inspections of new pipelines and the bill addresses that a little bit but it only applies to very large pipe-

lines. We think it should be expanded. I think the bill that came out from the administration asked for such fees. We also think there needs to be fees for special permits. That is an area where PHMSA gets spread too thin trying to deal with lots of special permits.

And the other area that we really think needs to be expanded is regulation of natural gas gathering lines. Like I said in my testimony, there is hundreds of thousands of miles of those going into places like Texas and Pennsylvania and New York, and a lot of those are unregulated or very much under-regulated. So that is an area that needs to be looked at.

Mr. HELMS. Yes, we believe the bill is a good bill and it has been a bill that has really brought in a lot of the stakeholders into the discussion, Mr. Chairman. And it is kind of interesting you are now hearing the administration, the oil pipeline guys, the Public Safety Trust and interstate natural gas industry agree that this is a good way for us to go forward.

In pages 8 through 12 of my testimony, we have some specific recommendations, and I would probably characterize them more as tweaks as anything else.

Mr. WHITFIELD. OK.

Mr. HELMS. I think we have a good start.

Mr. WHITFIELD. Thank you. Mr. Dippo?

Mr. DIPPO. Yes, likewise. The American Gas Association also believes that this is a good bill for our members. It was a good bipartisan product. A few areas we might recommend some tweaking or changes to the section on maximum allowable operating pressures seem to be a bit rushed. We would suggest possibly more time to review how that is written.

And the other thing, that seismicity, that section in there is actually already being addressed by operators on Subpart O, Part 192, which requires operators' integrity management operations under the preventive and mitigative measures to consider outside forces. So I am not really sure why that came up all of a sudden but we feel that is already being addressed by its members through the existing regulation.

Mr. WHITFIELD. Mr. Swift?

Mr. SWIFT. The NRDC defers to the Pipeline Safety Trust on most issues in the Lautenberg bill, but we are very pleased to see that there was a study required of the safety issues and regulatory sufficiency for tar sands crude. We would like to see language that gives PHMSA the authority to act on what they find in that study from a regulatory perspective.

Mr. WHITFIELD. And Ms. Quarterman, what is the budget for PHMSA?

Ms. QUARTERMAN. For the pipeline program?

Mr. WHITFIELD. Yes, the pipeline program.

Ms. QUARTERMAN. I don't know the exact number, around \$200 million.

Mr. WHITFIELD. How much?

Ms. QUARTERMAN. Around \$200 million.

Mr. WHITFIELD. 200, OK. I see my time has expired. Mr. Rush, you are recognized for 5 minutes.

Mr. RUSH. Thank you. Ms. Quarterman, in my opening statement I referenced the fact that just yesterday this subcommittee green-lighted a bill that will short-circuit the review process and force the administration to hastily come to a decision on the Keystone XL pipeline by November 1. Your Agency suggests recently shutting down Keystone 1 pipeline temporarily due to leaks from a pipeline that has been in operation for only 11 months. Can you discuss with the committee the events surrounding the temporary shutdown and eventual restricted opening of the Keystone 1 pipeline? And why did PHMSA initially make the decision to shut down the pipeline and then reverse itself and open it up with restrictions?

Ms. QUARTERMAN. This is fairly common practice in the way we operate on the enforcement side of things. We found a condition that had occurred on 2 occasions with respect to the Keystone pipeline, both on May the 7th and May the 9th where there was a leak from a similar component. And in those instances where we think it could be a systematic problem, the regional director puts forward an order telling them they need to shut down and come forward with a plan on how they plan to fix this, not only these 2 instances but across the board.

In this instance they came forward with a plan very quickly and that is why they got the restart plan I think a day or two after that.

Mr. RUSH. What were the conditions?

Ms. QUARTERMAN. I will have to get you the details of what the leak related to. I think it was in a pump station. There was a stripping of a valve or something like that.

Mr. RUSH. Is it unusual for a pipeline that has only been in operation for less than a year to have these problems? And have you ever issued a corrective order for a pipeline that has been in operation for less than a year?

Ms. QUARTERMAN. I am going to have to go back and look at our records to answer that question.

Mr. RUSH. OK. Does PHMSA have an updated and comprehensive plan for transporting diluted bitumen from the Canadian tar sands through the heart of the country as the Keystone pipeline would do?

Ms. QUARTERMAN. There is a requirement in the Senate bill that was passed out, I believe, of committee that would require PHMSA to do just such a study. We have not done a study on that in the past. If that were to be part of the final bill that came out of this committee and was passed into law, we would certainly be pleased to do that.

Mr. RUSH. All right. Mr. Weimer, the first Keystone pipeline, which brings Canadian tar sands to refineries in Illinois and Oklahoma was predicted to spill no more than once every 7 years. However, in just 1 year of operation it has reported 12 separate oil spills through the NRC, the National Response Center. You are considered an expert on pipeline safety and your work on pipeline safety issues is known far and wide. And as members in this subcommittee debate the importance of streamlining the permit process while also taking into account safety and environmental concerns, do you advise that we err on the side of safety or expedi-

ency? Is there a way to do both? And how should one member who is not necessarily opposed to the pipeline who is interested in creating more jobs because I represent a district where there is high unemployment, how should I approach this? From an expedited way or should I approach this from a public safety way? Give me some insight in how you would handle this situation.

Mr. WEIMER. Right. Thank you for the question. The Pipeline Safety Trust always embraces a precautionary principle that tries to answer as many of the questions as possible before you move forward. You know, Keystone 1 has had 12 spills in the last year, which is a lot of spills, although they were all fairly minor, all within kind of pump station areas. We have reviewed the corrective action order from PHMSA and think it was appropriate and even their backing off, you know, a few days later was appropriate because the company had done what they needed to address that system.

As far as permitting for Keystone 2, you know, we have joined with a number of national groups questioning—done research and have questioned things about the corrosiveness and the abrasiveness of the material moving through those pipelines from the tar sands and we have asked those questions of PHMSA. And to date, just as Ms. Quarterman said, they have not done that study so we don't know the answers to those questions. So using a precautionary principle, we would prefer to wait until those questions are answered before that pipeline moves forward.

And then we have also heard from EPA just last week that they also didn't know, you know, the toxicity of some of the material used to dilute that bitumen. So there is a number of unanswered questions and, you know, it is certainly up to the policymakers to decide whether they are big enough questions to allow something like that to move forward or not.

Mr. RUSH. Thank you.

Mr. WHITFIELD. Mr. Upton, you are recognized for 5 minutes.

Mr. UPTON. Well, thank you all. And again, I want to appreciate the administrator serving on one panel, particularly with these votes coming in.

I want to ask a question of each of you, and again this goes back to the personal experience of what happened in Michigan last year. Sadly, we had a pipeline break, a pretty large spill, and one of the issues that came from that was as we examined the existing legislation, I want to say that they were supposed to report in a timely manner. And there was some thought that perhaps the notice should have been given quite a bit earlier. And had it been within an hour or so of when it was first discovered, perhaps—and again there was great response by the first responders and they did a remarkable job—but had they had a little more time, they would have been able to kink the damage and do a much better job long-term.

It is my understanding that the Senate legislation does not have a specific time frame as to when it has to be reported to the national number. From what happened last year, our former colleague, Mr. Schauer, who represented that district introduced legislation that was 1 hour, I believe, from the time that it had to be reported. That is not in the Senate bill as I understand it. What

are your thoughts as to tidying up so that you had to report it nationally within 1 hour so that they, in fact, could be able to get the first responders there on the scene? And maybe we will start with the administrator and we will go down the line. And sadly that is the first buzzer of votes so I will make this my only question so I can let other members speak before 3 o'clock.

Ms. QUARTERMAN. Well, I can't speak to the specifics of that particular instant, but as to the broader question of the timeliness of notification, that is one that is obviously of great interest to us. And we have historically required companies to respond within an hour or two of notification. I believe that is in one of our safety advisories. And we would be happy to reconsider if that is not long enough or too long. We would be happy to talk about that further, but certainly we believe that when there is an incident, the emergency responders and we need to know as soon as possible.

Mr. UPTON. The national office is maintained 24/7, right? So if a call comes in at 3:00 in the morning, somebody is there to physically answer the phone, is that right?

Ms. QUARTERMAN. Not officially but in reality, yes, that is the case.

Mr. UPTON. Mr. Black?

Mr. BLACK. Operators are supposed to notify the National Response Center within the timelines the administrator said. I understand that in the Marshall, Michigan accident, part of the investigation is what the company went through to identify that there is a leak. We don't have a problem with the existing requirements. We would ask for the committee's help with the National Response Center.

There are 2 problems with the notification system that cause an inherent tendency to just make sure you have got it right. One is it is difficult to revise the estimate of a release once you make it, and you have to make it right there very quickly. So a company wants to make sure they get it right.

And second, you have got to quantify it very specifically. We would like to be able to report a general range of a liquid release. And that might remove some of the hesitations. I have not heard that in the Marshall, Michigan accident, but if we could work to improve NRC, National Response Center, regulations there, I think we would improve incident notifications.

Mr. WEIMER. We think response to the National Response Center as fast as possible is good. I don't have a time in mind clearly. I think what most companies are doing is probably adequate. Another important question is how quick either the NRC or the operator themselves contact the actual local first responders, because those are the people that need to hit the ground.

I think a bigger question that this brings to from the Michigan spill was why the leak detection system on that pipeline didn't work and it leaked all night long that delayed the response to anybody for 10 or 12 hours.

Mr. HELMS. There is a bit of a difference between liquids pipelines and gas pipelines. Our pipes will either leak or they will rupture and that can be detected through normal monitoring. So there is a little bit difference. I would defer to my colleagues and say that as soon as possible is a pretty good standard. We are judged by

that. If we have an incident, our regulators come back in and they do review our control room procedures to determine whether we have been responsive or not. In most cases I think we have found to be.

The issue for us, obviously, is having an appropriate supervisory control and data acquisition system that identifies the place where the incident may happen. And so we can notify local first responders as well as our own personnel to respond to it. I am very proud that our company has put together a fire school in southwestern Pennsylvania, and we have been training local firefighters across Pennsylvania to be able to respond to such emergencies.

Mr. UPTON. I know my time has expired so just go yes or no for the last two. One hour, yes or no?

Mr. DIPPO. No. As distribution operators, I would just say that we respond to distribution leaks on a 24/7 basis, 365 days a year and our concern would be that incidents or that they would overwhelm the NRC center in terms of with calls that are not true emergencies.

Mr. SWIFT. NRDC agrees with PST that as soon as possible.

Mr. UPTON. Thank you. Yield back.

Mr. WHITFIELD. Mr. Waxman, you are recognized for 5 minutes.

Mr. WAXMAN. Thank you, Mr. Chairman.

And Ms. Quarterman, we have seen the terrible string of pipeline accidents over the past year. Is this just a lot of bad luck or is our pipeline safety system under substantial stress?

Ms. QUARTERMAN. I wish I could say one or the other. I mean, I certainly have been greatly concerned by the incidents that have occurred. The fact that all 3 of the incidents have occurred in every part of the pipeline sector distribution transmission and hazardous liquids is of concern and the fact that they have all been in high-consequence areas is one of great concern to me, which is why we have been already undertaking many of the initiatives that are a part of this legislative proposal on the Senate side.

Mr. WAXMAN. Let me move through some other questions for you.

Ms. QUARTERMAN. Sure.

Mr. WAXMAN. Does your Agency have the resources it needs to ensure pipeline safety, and if you had additional resources would we see fewer explosions and spills?

Ms. QUARTERMAN. We have good resources as part of the proposal the administration put forward in 2010. We did request additional resources and we could certainly use them.

Mr. WAXMAN. I think your Agency is stretched pretty thin. I believe you are directly responsible for about 500,000 miles of pipeline but you have only 136 employees responsible for inspection and enforcement. That is over 3,500 miles of pipeline per inspector.

Mr. Weimer's written testimony identified numerous critical areas where PHMSA needs to issue rules or take other actions. These activities also require resources. In the testimony Mr. Weimer and Mr. Swift both highlighted safety concern related to pipelines that transport diluted bitumen. Ms. Quarterman, when PHMSA adopted its basic safety requirements, such as establishing maximum operating pressures or setting integrity management requirements, were many U.S. pipelines transporting diluted bitu-

men and were any of your regulations developed with the properties of diluted bitumen in mind?

Ms. QUARTERMAN. When the Integrity Management program requirements were first put in place on the hazardous liquid side I think it was 2000 and 2002, there were pipelines in existence that transport diluted bitumen. I don't believe any study was done at that time of the characteristics of the crude.

Mr. WAXMAN. Were your regulations developed with the properties of diluted bitumen in mind?

Ms. QUARTERMAN. I don't believe it was a part of the equation, no.

Mr. WAXMAN. Have you received your regulations to assess whether they adequately address any risks specific to diluted bitumen?

Ms. QUARTERMAN. We have not done so.

Mr. WAXMAN. OK. I was pleased to hear your response to Mr. Rush regarding the requirement in S. 275 that PHMSA analyze the safety risks of tar sands crudes.

Mr. Swift, why should we be concerned about pipeline safety with respect to diluted bitumen from tar sands?

Mr. SWIFT. We have seen many indications that this crude is both more damaging to pipeline systems and potentially more dangerous in the event of a spill. We have done comparisons of the Albertan pipeline system that moves more of this stuff in which we found that that system had 16 times as many incidents of internal corrosion per mile. We have seen earlier indications on the U.S. pipeline system that has been used early to move this stuff. I mean we have only seen it in the last 10 years really explode by volume—

Mr. WAXMAN. It not only is more corrosive; it may be moved at higher temperatures and pressures.

Mr. SWIFT. That is right.

Mr. WAXMAN. OK. Mr. Weimer, do we know whether the term "pipeline safety statutes" are adequate to address the issues Mr. Swift identified with pipelines transporting tar sands?

Mr. WEIMER. I don't think we do. As Administrator Quarterman has said, they haven't done that study specifically yet like the Senate bill asks them to do. And there are some questions about the corrosivity and the abrasiveness and the pressure and temperature that need to be answered.

Mr. WAXMAN. Well, I am concerned that the industry is changing but the safety regulations are not keeping up with the changes. That could be a recipe for disaster down the road.

Mr. Swift, what steps could Congress take to ensure that pipelines carrying tar sands are properly regulated?

Mr. SWIFT. I think the first step is we have to thoroughly examine the nature and magnitude of the risk. And so once we have the science, we can regulate the pipelines based on that science. So basically we need a study and then we need to get a system in place before we build more pipelines to move this.

Mr. WAXMAN. Mr. Weimer, do you agree?

Mr. WEIMER. Yes.

Mr. WAXMAN. Thank you, Mr. Chairman.

Mr. WHITFIELD. Yes. The gentleman from Texas is recognized for 5 minutes.

Mr. BARTON. And Mr. Chairman, I am not going to use all 5 because I know we have a series of votes.

First, I just want to welcome Andy Black to the committee. I think most of the senior members remember Andy as a committee staffer back when I was chairman. Before that, he was also my legislative staff director. So it is interesting to see him on the other side of the desk there.

My first question is just a general question. Is there anybody here at the table that does not support reauthorization of a pipeline safety bill in this Congress? So everybody is supportive of that? Is everybody supportive of continuing the general policy where we have kind of an interactive cooperative working arrangement between the regulators and the regulated parties? Is anybody OK with that? OK.

My friend Mr. Waxman just commented on something called diluted bitumen. I think that is a fair question. My physics and chemistry is pretty limited. My engineering degree is about 40 years old now but my recollection is that there are 3 kinds of items. You have a gas, a liquid, or a solid. Obviously, on pipelines you are not going to be transporting too many pure solids, but we do have gas pipelines and liquid pipelines. Within those general categories, different liquids, different gasses obviously have different characteristics, temperatures, flammability, volatility, viscosity, things like that. But is there any reason, Mr. Black, to feel that this diluted bitumen is of a special nature that it requires special regulations?

Mr. BLACK. No. It is a heavy crude when it is moved through the pipelines. The bitumen is mixed with a condensate before it is a pipeline-quality transportation. That is like a heavy crude from California, Venezuela, and other oil sands. Diluted bitumen has been moved through pipelines for many years. There is a FERC tariff about elements of sediment and water that TransCanada Keystone XL would have to live up to. There are corrosion regulations implemented by PHMSA that Keystone XL will have to live up to.

While there has not been a formal study by the administration, this has been a part of the multi-agency review process. There were many special conditions proposed for TransCanada by PHMSA. None of these deal with this idea that there is some incremental corrosiveness in the product. It is a heavy crude.

Mr. BARTON. OK. I want the record to show that I did not pre-clear that question with Mr. Black, but it sounds like he knew I was going to ask him the question. That was a very thoughtful answer.

Administrator Quarterman, do you generally share the view that Mr. Black just proposed to the committee?

Ms. QUARTERMAN. Well, I don't believe that I am in a position to opine. My engineering degree is not quite as old as yours but it sounds like you remember more than I do. I would defer to any studies that might be performed by our Agency on answering that question.

Mr. BARTON. I think it is something, Mr. Chairman, we need to look into but I don't think it is definitive or determinative that that one thing should stop a reauthorization bill. With that, I would yield back to the chair.

Mr. WHITFIELD. Thank you. We do have 24 votes on the House floor, and what we are going to do, we are going to try to give everybody here an opportunity to ask questions. So Mr. Green, we are going to go to you and then Mr. Olson and then Mr. Inslee because I don't want you to hang around for 2-1/2 hours or so.

Mr. Green, you are recognized.

Mr. GREEN. Thank you, Mr. Chairman. I will be as quick as I can.

I have a district in Houston in East Harris County. I have never not lived on a pipeline. And I have noticed during my lifetime how much it is so much better than what we are getting. And I have a house now that we, on a regular occasion, get contacts from our pipeline safety state agencies, obviously the federal agencies. So our reauthorizations over my career on this committee have been thorough and I hope this would be the same thing.

Let me go quickly, so Ms. Quarterman, I want to applaud you and the secretary for addressing the issue of pipeline safety head-on. There is a national dialogue on pipeline safety because that is probably the most number one issue in the district I represent because we live and work there. Pipelines are much safer than having them run down the road on a tank truck, but we have plenty of tank trucks, too.

What kind of responses have you heard or you see from industry and others when you rolled out your call for action?

Ms. QUARTERMAN. The responses have been very positive. The secretary and I met with the leaders of several companies, presidents, and sat down and told them we wanted to have a conversation. We wanted to all work together, bring all the constituents together and try to figure out how we might move forward with our agenda. We just had a meeting yesterday out near Dulles. We are in the midst working with our technical advisory committees of putting together a report to America about the current status of pipeline safety in this country and how we might move that ball forward. So everything has been positive so far.

Mr. GREEN. Can you explain when NEPA was triggered—I know that was a concern from Ranking Member Waxman—and when NEPA is triggered from your office?

Ms. QUARTERMAN. We are not involved with the Keystone XL project or the NEPA analysis. We are not performing the NEPA analysis. It is being led by the Department of State. I don't know if that is where you are going to.

Mr. GREEN. OK. And I understand that if you have more corrosive going through a pipeline and some of the substance, you just have to make sure you inspect it a lot more and, you know, and you check it because metrology is something that has been done for decades.

Mr. Black, if Congress decides to expand the PHMSA's reach on the offshore gathering pipelines, what are your concerns? And my understanding is that these gathering lines may not be large enough to use smart pigs.

Mr. BLACK. Right, gatherings generally intrastate can be regulated by the States. If it is on the OCS it can be regulated by interior. Like you said, Congressman, these are small lines, maybe 2 inches to 8 inches in diameter operating at low stress. Some of these things are marginally economic or serving marginally economic wells. Depending on what PHMSA would do with regulations, it could result in some shut-in supply.

Mr. GREEN. Well, and I know because shallow-well drilling you do have marginal wells, ones that may not be big, although our committee was actually on a rig in deepwater and those pipelines—from that deepwater is a Chevron rig off Louisiana—actually were big enough because they had enough production, you know, 110,000 barrels a day you could have that.

Mr. Chairman, I appreciate it and I would like to yield what I have left to my colleague from Washington.

Mr. INSLEE. Thank you, Mr. Green. First, I want to thank Mr. Weimer for your leadership. I think of Liam Wood and Wade King and Stephen Tsiorvas. We appreciate your leadership.

Quick question for Ms. Quarterman. The information we have today and others have suggested that there is some viable concern about this relatively new product from the tar sands and what risks it may or may not present. Doesn't it make sense from a first-do-no-harm sense for us to have a sophisticated analytical objective analysis of this particular product before we decide what the appropriate maintenance systems and inspections systems are?

Ms. QUARTERMAN. I would have to leave that up to Congress in terms of whether or not you would like to legislate such a requirement. I don't want to get into the Department of State's jurisdiction in terms of whether or not to approve this project or not. I am going to leave it with them to give an opinion about—

Mr. INSLEE. Well, I am not thinking of just whether or not to approve this particular project. The issue is shouldn't we have an objective assessment of the corrosive properties and perhaps new maintenance requirements for this or any other line just as a matter of national policy? Don't we really need that from your Agency?

Ms. QUARTERMAN. Well, our Agency is not really involved until a pipeline has been permitted. The secretary has gone around and said quite a bit about the fact that we have a bit of a patchwork here in that the FERC, for example, is responsible for deciding on whether or not a gas pipeline will be approved and we only come in after the fact. On the oil side, the only time there is any oversight on whether a pipeline will be put in the ground is if it crosses international boundaries, and that is the case with respect to Keystone XL. Otherwise, there is no federal regulatory review or approval of putting a pipeline in the ground. That is a broader question, I think, for the committee about how that works and whether it makes sense.

Mr. INSLEE. We have some work to do. Thank you.

Mr. WHITFIELD. Mr. Olson?

Mr. OLSON. I thank the chair for his exceptional courtesy and want to welcome the witnesses and thank you for coming and giving us your time and your expertise.

First of all, I just want to start by giving some of my perspectives as a representative of Texas 22. No one here in Congress cares

more about pipeline safety than Congressman Pete Olson does. I represent Texas 22, which is part of the energy capital of the United States. And we are Texans. Texas is the energy capital of the world, and we have these tremendous petrochemical facilities along the Port of Houston, which is the largest—the tonnage and gross international tonnage in America. And the pipeline infrastructure that supports the port and the petrochemical industry is critical to our economy not only in Southeast Texas but the entire country.

But not only are the pipelines part of our economy, they are a part of our quality of life. And just an example that is about a mile from my house in Sugarland, Texas is Sugarland Memorial Park, and right next to that is the University of Houston, Sugarland. These are fairly new facilities built the last 10 years. I take my dog Riley walking through the park every day I am home. And they are built right on a natural gas pipeline, which runs right through the middle of them. Again, very, very safe.

And since I have joined Energy and Commerce, I have spent a lot of my time when I am back home talking to some of the pipeline operators just to get up to speed on what they are doing and what their safety is like. And one great privilege I have representing this district is I also represent the Johnson Space Center, you know, home of NASA, Mission Control. And I can tell you, I can assure you that having seen Mission Control on the inside and having seen the control room for these pipeline operations, it is very hard to tell which one is which. I mean the technology is amazing.

I mean one pipeline—one company I toured had pipelines all across the northeastern part of the United States with the control room right there in Houston, Texas. They had an automatic system. If there is a drop in pressure somewhere between all the little terminals they have, automatically downstream it would be shut off. They had a man just in case the system didn't work. A man was there, a human being, watching, monitoring the system who could hit a button and shut it off from Houston, Texas. It is just an amazing, amazing amount of safety that these pipeline companies have. And I think the American people deserve to know that.

I know we all agree that there should be zero pipeline incidents. That should be our goal. But again, I am concerned about some of the things we are talking about doing here from a regulatory perspective. And my first question is going to be for Mr. Black and Mr. Dippo. And I would like these comments from you, Administrator Quarterman.

But as I understand right now, the determination of what is considered a high-consequence area is risk-based, makes sense. If our pipeline miles, all of them are concerned under HCA standards, wouldn't that diminish the focus of where we should be focusing? I mean where it truly has a greater consequence, population centers, unusually sensitive areas, environmental areas, drinking water intakes, wildlife refuges, my home in Sugarland, a mile and a half of pipeline? I mean shouldn't that pervade as opposed to making it standard all across the country? And again, Mr. Black, would you like to take a shot at that?

Mr. BLACK. Well, we think it is right to have high-consequence areas. And Congress and PHMSA are right to implement them that

way. It would divert the focus on those areas of highest consequence if the integrity management areas were going to be expanded. Operators do a lot on the areas of a pipeline beyond high-consequence areas, and there are a lot of federal regulations that require that. There are voluntary assessments of those areas outside of a high-consequence area. But you don't follow the same rigid repair criteria that you do inside. So we think it is right to keep the focus on a high-consequence area, yes, sir.

Mr. OLSON. Mr. Dippo, do you care to comment, sir?

Mr. DIPPO. Yes, I would agree with everything Mr. Black said, and in addition I would just like to indicate that, you know, as an operator in New Jersey being the most densely populated State, our State Regulatory Commission has looked at it from that perspective and has regulated and asked us to look at more than just high-consequence areas. But that is specific to our State and our operations in New Jersey. So I don't believe and I don't think that it should be applied across the board. Certain areas, yes, but other than that, no.

Mr. OLSON. Yes, sir. I have 26 seconds. Administrator Quarterman, would you like to make a comment, ma'am?

Ms. QUARTERMAN. Yes. We have a pending rulemaking asking a question regarding this and there are two ways to think of this. One is whether or not the definition of a high-consequence area is adequate as it stands. There have been some incidents that occurred recently where it was obvious to me it was a high-consequence area because there were spills in a large body of water except it wasn't clear when we were trying to figure out was this in fact a high-consequence area. So I think we have to make sure that the definition is adequate.

The second is that in terms of dealing with high-risk areas first, I think that is absolutely appropriate. However, that doesn't mean that the remaining areas could not also be assessed perhaps on a longer time period, something like that I think those are things that we are considering and want to discuss further.

Mr. OLSON. Yes, ma'am. If I could just sum up, the people in my district want a high-consequence area to be a high-consequence area. I appreciate my time and yield back the 43 seconds that I am over.

Mr. WHITFIELD. That concludes today's hearing. We actually had other questions we wanted to ask but, as I said, we have got these 20-some votes on the floor and a Motion to Recommit. So we look forward to working with all of you as we move forward with reauthorization legislation. Thank you for your time and your input. And this hearing is concluded.

[Whereupon, at 12:00 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

PREPARED STATEMENT OF HON. JOHN SULLIVAN

Today marks the 11th day in our American Energy Initiative hearing. While the series has allowed us to examine a multitude of issues regarding energy production, regulation and consumption, today we will focus on what can be done to improve the safe and secure delivery of oil and natural gas via pipeline.

Several tragic pipeline accidents have occurred over the past year which demonstrates the need to reauthorize and enhance current safety laws. Despite this Committee room frequently being the site of many tense debates and discussions,

pipeline safety is an issue I hope we all can work together on to produce meaningful and effective legislation to ensure the safety of our oil and gas pipeline infrastructure for the future while protecting the American people and our environment.

Over the past several years, we have been able to pass bipartisan bills on pipeline safety sometimes under suspension on the House floor. This is because our pipeline infrastructure touches every congressional district and accidents can happen anywhere and at anytime. Before us at the witness table we have a Democrat from California and a Republican from Montana. Both have dealt with major accidents recently and both understand Congress must act to strengthen current pipeline laws.

It is critically important that our pipeline infrastructure is both reliable and durable and to this end, the discussion draft under examination today makes many important modifications to existing law that will promote greater pipeline safety standards. We are glad to have an opportunity today to hear from the experts how this discussion draft might be improved or otherwise modified to ensure pipelines remain a safe and economical means of transporting vital energy supplies that help power our economy and create jobs.

With that, I yield the balance of my time to Mr. Barton for an opening statement.

RESOLUTION NO. R2010-008

A RESOLUTION OF THE CITY OF DENTON, TEXAS, ENDORSING REGIONAL "BEST PRACTICES" STANDARDS CALCULATED AT FOSTERING IMPROVED INTRASTATE GAS UTILITY-MUNICIPAL RELATIONS WITH REGARD TO THE ACQUISITION AND ROUTING OF PIPELINE RIGHTS-OF-WAY THROUGH INCORPORATED AREAS AND EXTRA TERRITORIAL JURISDICTION AREAS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Denton, Texas is a duly incorporated municipality located in Denton County, and created in accordance with the provisions of Chapter 8 of the Local Government Code and operating pursuant to the enabling legislation of the State of Texas; and

WHEREAS, the development of the Barnett Shale has necessitated the installation of a comprehensive intra-state pipeline network though which produced hydrocarbons are carried from gas well operators to the public utility system; and

WHEREAS, this pipeline network frequently conflicts with the long range comprehensive planning goals of north Texas municipalities and creates hardship for individual property owners affected by pipeline routing; and

WHEREAS, in an effort to mitigate the conflict and hardship posed by pipeline right-of-way acquisition and routing the Texas Pipeline Association, a private trade association representing the interests of the intrastate pipelines in Texas, has endorsed the concept of a regional "best practices" policy; and

WHEREAS, through the collaborative efforts of many north Texas municipalities and the Texas Pipeline Association and its members, the parties have developed guidelines entitled: "Best Practices for Pipeline and Municipality Relations"; and

WHEREAS, the City Council of the City of Denton, reviewed the "Best Practices for Pipeline and Municipality Relations" guidelines developed by this group, and decided to revise these guidelines in an effort to address certain issues; and

WHEREAS, the revised non-binding "Best Practices for Pipeline and Municipality Relations" guidelines constitute a series of non-legislative standards setting forth the parties' expectations with respect to pipeline pre-routing, right-of-way acquisition and construction; and

WHEREAS, the City Council of the City of Denton, Texas has determined that it is in the best interest of the public health, safety and general welfare to endorse the revised non-binding "Best Practices for Pipeline and Municipality Relations" guidelines attached hereto; and

WHEREAS, the City Council of the City of Denton, Texas would further encourage intrastate gas utilities to endorse and commit to the standards set forth in the revised "Best Practices for Pipeline and Municipality Relations" guidelines, with respect to pipeline operations in incorporate areas, NOW, THEREFORE,

s:\our documents\resolutions\10\best practices pipeline reso.doc

THE COUNCIL OF THE CITY OF DENTON HEREBY RESOLVES:

SECTION 1. The City Council of the City of Denton, Texas, does hereby endorse the revised "Best Practices for Pipeline and Municipality Relations" guidelines attached hereto as Exhibit "A". The revised "Best Practices for Pipeline and Municipality Relations" guidelines are not intended to serve as legislation of the City of Denton, Texas, and instead are calculated at fostering improved intrastate gas utility-municipal relations with regard to the acquisition and routing of pipeline rights-of-way through the City.

SECTION 2. This Resolution shall be effective from its date of adoption.

PASSED AND APPROVED this the 10th day of April, 2010.


MARK A. BURROUGHS, MAYOR

ATTEST:
JENNIFER WALTERS, CITY SECRETARY

BY: Jane Richardson, Asst.

APPROVED AS TO LEGAL FORM:
ANITA BURGESS, CITY ATTORNEY

BY: Anita Burgess

Best Practices for Pipeline and Municipality Relations

I. Pre-Routing:

- A. Municipality will designate the department or person with whom pipeline operators should meet prior to obtaining easements and planning of final pipeline route.
 1. Municipality will provide a packet of information which includes all ordinances and other planning documents which are applicable to pipelines. Pipeline operators will read all ordinances in advance.
 2. Pipeline operators will present municipality with preliminary route(s) of pipelines, as well as accessory equipment including, but not limited to compressing facilities, from origin to terminus within the municipality's corporate boundaries together with fixed routing issues (e.g. known well locations that must be connected, existing right of way considered, required and anticipated issues along the preliminary route known by the pipeline operators to affect the routing).
 3. Utilizing the municipalities' development review process, municipalities will provide initial development review comments on the preliminary route within a reasonable amount of time. Reasonable time is defined as *not longer than two (2) weeks for gathering lines and not longer than four (4) weeks for transmission lines*. Pipeline operators agree to respond to the municipality's comments in a reasonable time frame.

- B. Consistent with the provisions of Section 181.005(b) and (c) of the Texas Utilities Code, pipeline operators will comply with the following requirements in determining routes within a municipality:
 1. *In determining the route of a pipeline within a municipality, a gas corporation shall consider using existing easements and public rights-of-way, including streets, roads, highways, and utility rights-of-way. In deciding to use a public easement or right-of-way, the gas corporation shall consider whether:*
 - (1) *the use is economically practicable;*
 - (2) *adequate space exists;*
 - (3) *the use will violate, or cause the violation of any pipeline safety regulations.*
 - (4) *the use may require an annual charge for pipeline placement; and*
 - (5) *the use may require cost recovery for public infrastructure damage.*
 2. Route will be as consistent as practical with existing municipal planning documents and standard utility construction practices for existing and future municipal land uses while respecting private property rights.
 3. Both parties will strive for the most direct, cost effective, and time efficient route.

4. The location of pipelines in public rights of way, utility easements or other City owned property may not interfere with or damage existing utilities or prevent the installation of master planned municipal infrastructure.
5. Pipeline operators will actively participate in planning of preferred pipeline routes with contiguous municipalities on a project by project basis.

II. Right-of-way Acquisition:

- A. Pipeline operators will require right-of-way agents to be registered with the Texas Real Estate Commission (TREC).
- B. Pipeline operators commit to negotiate in good faith with property owners before resorting to eminent domain. If eminent domain is to be utilized in the corporate city limits of a municipality, the pipeline operator will provide prior notice to the City Manager, or chief administrative official, of the affected municipality.
- C. A current copy of the GENERAL GUIDELINES FOR RIGHT OF WAY ACQUISITION, CONSTRUCTION AND OPERATIONS is attached to this document as Attachment A.

III. Construction Phase:

- A. Municipalities commit, when practical, to grant temporary working easements within public rights of way during construction consistent with existing regulatory authority.
- B. Pipeline operators will promptly respond to complaints and will provide to the City contact information for a 24-hour representative who can be reached at all stages of construction.
- C. Pipeline operators will work cooperatively with municipalities in locating pipeline structures in relations to critical municipal infrastructure.
- D. Pipeline operators shall only remove trees and other vegetation in a manner that is consistent with local ordinance(s), unless additional removal is demonstrated as being necessary for pipeline safety and/or regulatory compliance.
- E. Pipeline operators will provide copies of "as built" plans, pipeline inventory updates, and final pipeline routing maps within the municipalities' corporate limits and extra territorial jurisdiction (ETJ) in a format acceptable to the Municipality. These maps will include accessory equipment including, but not limited to, compressing facilities.
- F. Municipalities and their contractors will commit to use the State's One-Call system when undertaking any excavations in order to avoid damaging pipelines.

IV. Desirable:

- A. Pipeline operators will work with municipalities to employ principles to reduce noise and environmental impacts on neighboring residents and businesses, consistent with existing local ordinances.
- B. When the pipeline operator has the right to do so and it is reasonable to do so, and when it would not unreasonably interfere with operations, the pipeline operator may grant municipalities surface uses in pipeline easements.